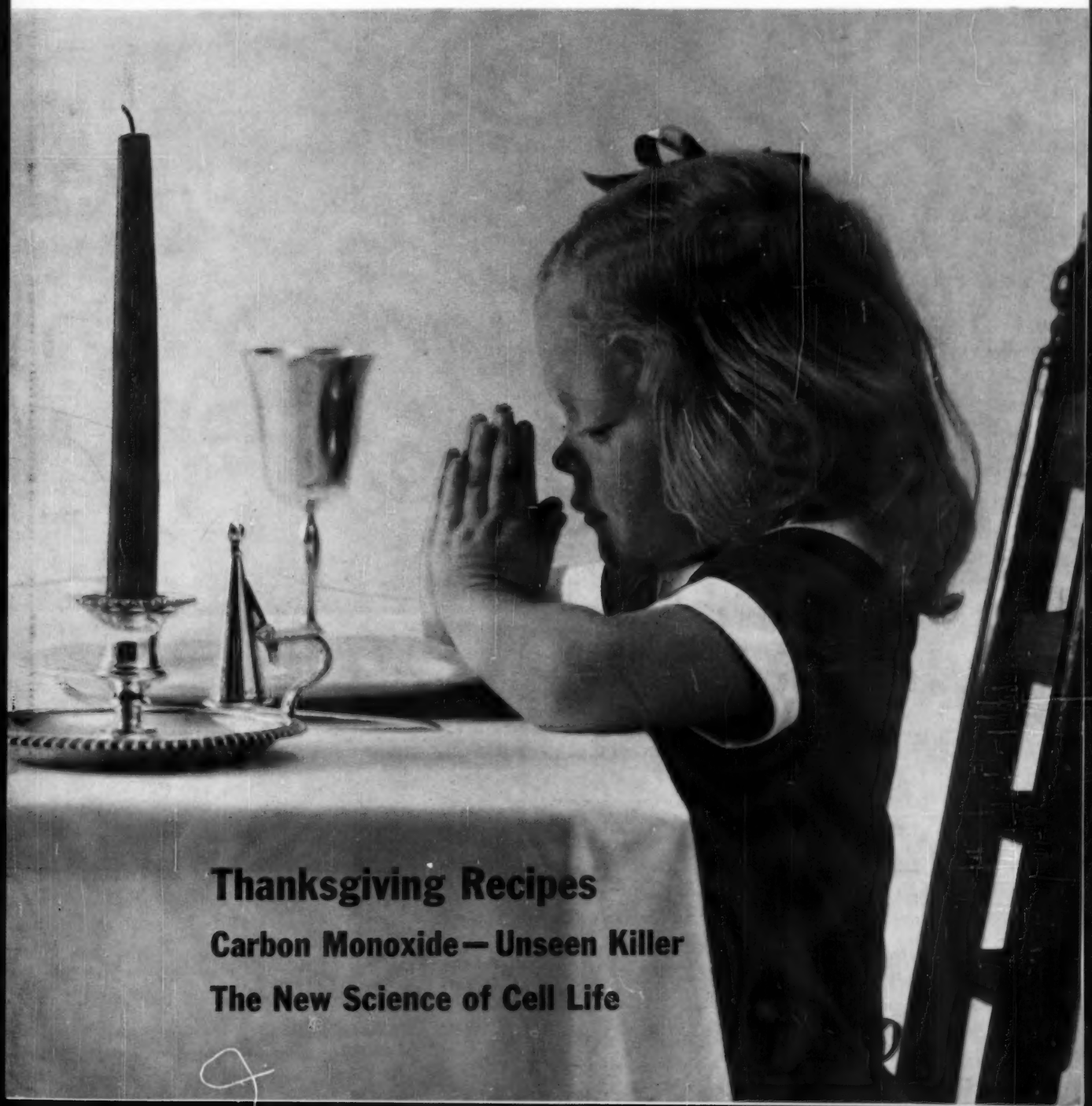
Today's Health

PUBLISHED BY THE American Medical Association

NOVEMBER 1961 FOR THE AMERICAN FAMILY 35¢



Thanksgiving Recipes

Carbon Monoxide—Unseen Killer

The New Science of Cell Life

Doesn't everybody know all Heinz Baby Foods have screw-on caps?

• Now Heinz—and Heinz alone—offers you the easy-opening convenience of screw-on caps on *all* Strained and Junior Foods, including Meats and High Meat Dinners.

• Ask your doctor about Heinz Baby Foods. They are outstanding in quality—famous for their fine flavor, color and texture!

57

HEINZ Baby Foods

...over 100 better-tasting varieties

Another New Margarine From Fleischmann's

First Unsalted Margarine Made from 100% Corn Oil Is Ideal for Restricted Diets!

- Ideal for sodium-restricted diets!
- Ideal for diets high in polyunsaturates!
- Contains almost one cup of liquid corn oil per pound!
- Fresh-Frozen to protect its sweet, delicate flavor!

Today, many Americans observe a wide variety of restricted diets. Among these are sodium-restricted diets and diets high in polyunsaturates. Now, to aid people on these restricted diets, Fleischmann's announces new Fleischmann's Unsalted (Sweet) Margarine.

No Salt Added!

This delicious new margarine has no salt added. It contains about 70 times less sodium than salted spreads. Yes, it contains less than 3 mgs. of sodium per ounce. That's why it's ideal for you if you're on a sodium-restricted diet.

High In Liquid Corn Oil!

What's more, Fleischmann's Unsalted Margarine is made from 100% corn oil, with almost one cup of liquid corn oil in every pound. It also contains another cup of corn oil, partially hydrogenated to help protect Fleischmann's sweet, delicate flavor.

Fleischmann's Unsalted Margarine gives you high linoleic content, high polyunsaturates. That's why this new margarine is ideal for you if you're on a diet high in polyunsaturates.

If you're on a sodium-restricted diet or diet high in polyunsaturates, or if you simply prefer the sweet flavor of an unsalted spread, this is the margarine for you. Get new Fleischmann's Unsalted (Sweet) Margarine in the green foil package in your grocer's frozen food case.

Fleischmann's also makes a lightly salted margarine, made from 100% corn oil, partially hydrogenated. It's in the golden foil package in the refrigerated case. Both Fleischmann's Margarines are sold on the West Coast in the familiar cube form.

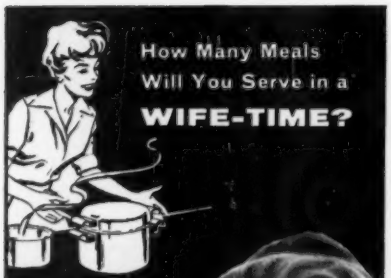
Distribution presently limited in some areas.

By the Makers of Fleischmann's Yeast

BE SURE your margarine is made from 100% corn oil for delicious flavor. Read the list of ingredients on the package front.

Give your family the dietary benefits of...

Fleischmann's UNSALTED (SWEET) MARGARINE



How Many Meals Will You Serve in a **WIFE-TIME?**

- 10,500?
- 26,900?
- 43,800?

(You'll find the Answer below)

Enjoy Your Wife-Time of Cooking with

SOLAR PERMANENT Stainless Steel **COOKWARE**

Treat your family to foods with more of nature's own tempting, fresh flavor . . . more of nature's own rich, ripe color . . . more of nature's own bountiful vitamins and minerals. SOLAR PERMANENT Triple-Ply Stainless Steel Cookware makes it so much easier for you to serve tastier, more wholesome meals to tempt even listless appetites. That's because you cook the modern, scientific waterless way. SOLAR PERMANENT gives you savings in so many ways—in time, in work, in money, in food. A SOLAR PERMANENT set gives you everything you will ever need for a wife-time of cooking. Heirloom quality you'll proudly own and use throughout your wife-time.

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Answer to Quiz: YOU'LL SERVE 43,800 MEALS IN AN AVERAGE WIFE-TIME OF 40 YEARS

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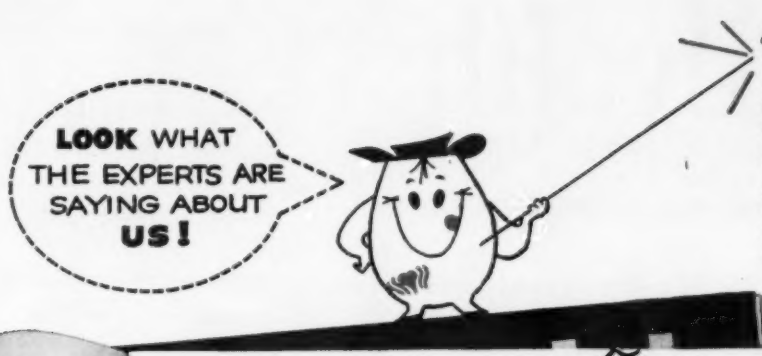
COMING NEXT MONTH—

Enzymes: Chemical Keys of Health and Disease

Used for centuries in making bread and cheese, and more recently as meat tenderizers, enzymes are now assuming wide applications in medicine—from diagnosing heart disease and promoting digestion to dissolving clots and reducing black eyes. But present uses are barely beginning to open up a largely unexplored frontier, promising new therapies that may make today's amazing achievements seem timid and unimaginative.



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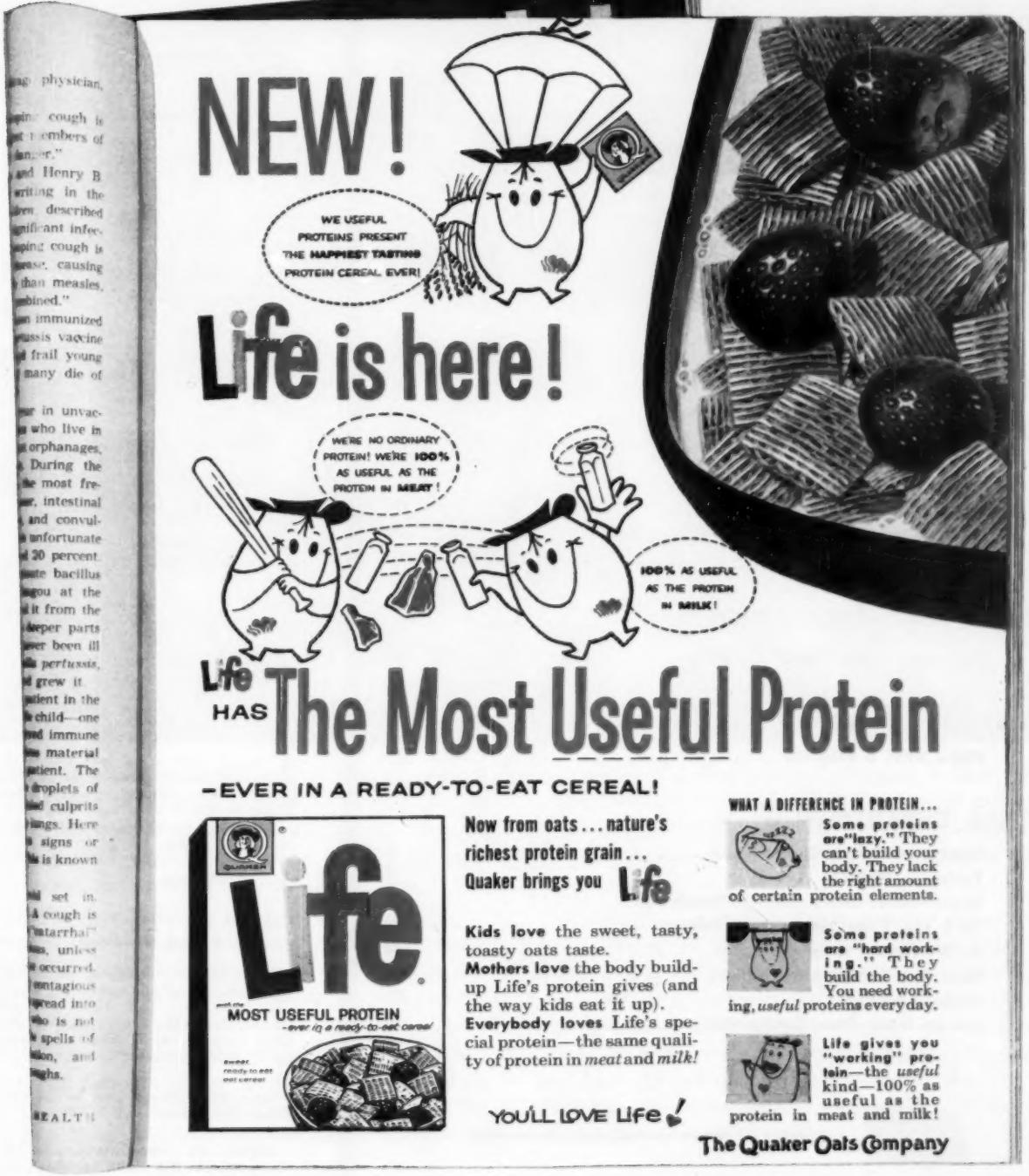
NEW!
WE USEFUL PROTEINS PRESENT THE HAPPIEST TASTING PROTEIN CEREAL EVER!
Life is here!
WE'RE NO ORDINARY PROTEIN! WE'RE 100% AS USEFUL AS THE PROTEIN IN MEAT!
100% AS USEFUL AS THE PROTEIN IN MILK!
Life HAS The Most Useful Protein
-EVER IN A READY-TO-EAT CEREAL!
Life
MOST USEFUL PROTEIN
-ever in a ready-to-eat cereal
Now from oats... nature's richest protein grain... Quaker brings you Life
Kids love the sweet, tasty, toasty oats taste.
Mothers love the body build-up Life's protein gives (and the way kids eat it up).
Everybody loves Life's special protein—the same quality of protein in meat and milk!
YOU'LL LOVE Life!
WHAT A DIFFERENCE IN PROTEIN...
Some proteins are "lazy." They can't build your body. They lack the right amount of certain protein elements.
Some proteins are "hard working." They build the body. You need working, useful proteins every day.
Life gives you "working" protein—the useful kind—100% as useful as the protein in meat and milk!
The Quaker Oats Company

Today's Health

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November 1961

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American Medical Association

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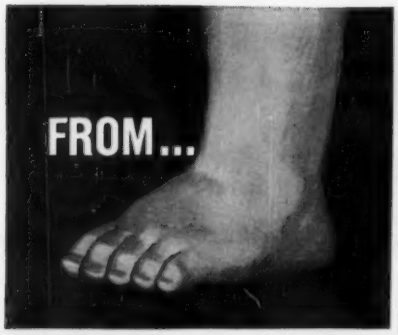
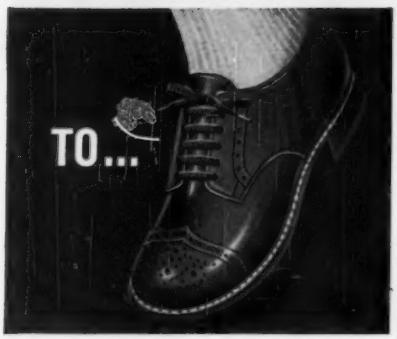
It's a happy scene. Two prideful mothers comparing notes about their babies. Perhaps each boasts a little about the growth and achievements of her little one. Perhaps each advises the other about foods her baby is taking and on other matters affecting his health. It's all happy, harmless and reassuring—provided, of course, that each mother has the security that comes from knowing her baby's health and well-being are supervised by the physician, whose training qualifies him to advise about such matters.

Take the matter of nutrition, for example. Some parents feel that they can choose the foods the baby will eat during early infancy, without consulting a doctor. Yet, with all their good intentions and natural capacity for mothering, difficulties may arise because it takes the physician's skill to choose the proper foods in the proper quantities and combinations for a baby. Occasionally the disadvantages of unsuitable foods may not show up for some time.

The time to consult your physician is *before* you experience difficulties; and the decision about the baby's early foods as well as other matters affecting his health should be left in the hands of the doctor, who is qualified by training and experience to advise in such matters. That is why many companies manufacturing the first foods for babies advertise only to the physician. They leave to him the decision about a baby's feeding, and advise parents to do the same.

This advertisement is published in the interest of the welfare of your children by Ross Laboratories, Columbus, Ohio.





...Most Important Period for Foot Protection

It doesn't take long . . . from first faltering steps to foot races . . . children form the foundation for strong, healthy feet in a few early years. That's when you should take the greatest care in shoe selection. Look for Edwards, a shoe unmatched for sturdy construction and careful craftsmanship. All styles, sizes and types for Toddlers, school-agers, and children with special foot problems. See them at your dealer's soon.

Edwards
THE SHOE FOR CHILDREN
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FREE BOOKLET
Learn more about children's shoes
Informative brochure on shoe construction with special tips on foot care, "Guide to Happy Feet." Write Edwards Shoes, Dept. D, 314 N. 12th St., Philadelphia 7, Pa.

that's a good QUESTION

Edited by WILLIAM BOLTON, M.D.

Bleeding Under Skin

As I grow older (I am now 66), I seem to bruise more easily. After even the slightest bump, I get big blue patches under the skin. Is this normal, or do you think I might be developing some blood condition?

The problem of bruising easily is observed rather commonly in older persons. In the absence of specific disease, it is considered to be due to atrophy and relaxation of the skin and subcutaneous tissues. As we grow older, these lose much of their elasticity, and therefore do not produce the general tissue compression that is constantly present in younger people. Thus, when capillaries are broken by a bruise, blood tends to seep out more freely.

Both old and young women are more subject to this than are men, the tissue structure in females being somewhat more delicate. It would be sensible to talk with your physician about this matter, since in your case there may be other causes of bleeding beneath the skin.

Blood "Factory" Replacement

I understand that blood destruction is an important factor if a person is exposed to the fallout of an atomic explosion. Why can't this be solved by widening the use of blood transfusion facilities? There must be millions of pints of blood that could be used at once.

It is true that the Red Cross and other organizations have large reserves of donated blood that would be extremely important in emergency treatment of atomic blast victims. But giving this blood would help only temporarily. After extreme radiation exposure, the bone marrow, the "factory" where red cells are formed, is destroyed. This means that all such victims would require a continuous supply of donated blood, and in any extensive catastrophe, transfusion facilities would be inadequate.

There is the hopeful possibility that medical science can overcome the basic problem, for there have been reports of successful transfusion of bone marrow rather than blood cells alone. If it is accepted by the recipient's body, such marrow can continue to grow and produce red cells. The chief problem is whether compatible marrow can be given, just as it is necessary to give the correct type of red cells. It has been suggested that, ideally, everyone should have his own sample of bone marrow "banked" for future withdrawal if the need should ever arise.

How to Swallow a Pill

Why do I have so much trouble swallowing pills? I get them well back in my mouth, and throw my head back, take a good swig of water, and what happens? The water goes down, and the pill ends up right where it was. Do you suppose I have an unusually narrow throat?

The answer may be in the way you throw your head back. Rather than widening the passageway, this may tend to narrow it. If you try this out, you will find that most solid pieces of food can be swallowed easier if you keep the head lowered or at least level. With liquids it is different, a funnel effect being created when the head is thrown back.

In your case, there may also be a spasmodic contracture of muscles in the throat, narrowing the opening. This could be due to nervousness, which probably your physician could help you to overcome.

Stones From Rhubarb?

A friend has advised me to avoid rhubarb because of the chance it

might lead to formation of calcium stones in the kidneys. Is this a serious problem?

It is not calcium in rhubarb that may present a kidney stone problem. This and various leafy vegetables, such as spinach and other greens, have a high content of oxalic acid. If consumed in large amounts, oxalic acid may be converted to calcium oxalate, and this salt of the acid may precipitate out of the urine. Excessive calcium intake is relatively unimportant in this situation. Calcium is constantly present in the blood stream, so it can be combined readily with the oxalic acid to form calcium oxalate crystals.

Circulation Changes

I have been told that the reason my feet are constantly cold is poor circulation. What does this mean? Is it poor just in the feet, and why is it poor?

We agree that "poor circulation" is a vague, indefinite term that might better not be used. Without knowing much more about your physical condition, we cannot determine why there appears to be interference with normal circulation in your feet, or whether this actually is the problem.

Some people may find their feet, and often their hands, feel cold most of the time, yet studies show no abnormality of circulation. In such patients, nervousness is often a prominent symptom. Also, the cold sensation may be entirely subjective, and the feet will not feel cold to the touch.

Actual reduction in the normal blood supply to the legs and feet may be produced by blood vessel narrowing as a result of arteriosclerosis; similar changes may appear in persons with diabetes. However, in such cases there are usually other changes, including muscular cramping due to lack of blood, and sometimes even gangrene of the toes if the decrease in blood flow is extreme.

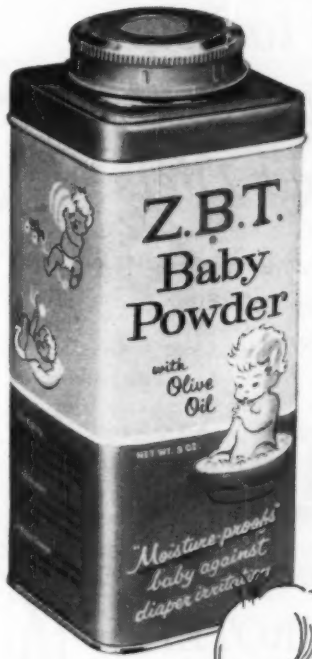
Eclipse Damage to Eyes

Is it safe to watch an eclipse of the sun with ordinary dark glasses or an exposed photographic film to protect the eyes?

After each eclipse of the sun, physicians report caring for patients

(*Continued on page 19*)

Now! The "perfect pair" for baby skin care!



"Moisture-Proof" your baby against diaper irritation with

Z.B.T. Baby Powder with Olive Oil

Where ordinary powders absorb irritation-causing moisture, Z. B. T. with Olive Oil *repels* it. Forms a lasting, silky-smooth sheath of protection. Also guards against chafing and prickly heat. Used by hundreds of hospital nurseries.

Keep baby's skin "birth day" sweet 2 ways with

New Z.B.T. Baby Lotion containing Zephiran

Delightfully fragrant new lotion with wonder ingredient Zephiran not only soothes, smooths, softens ... but also protects against rash and irritation-causing bacteria every minute it remains on the skin! Leaves no greasy, sticky film!

Mothers! Try Z.B.T. Baby Lotion on your own skin and see for yourself how it will smooth and soothe your baby's tender skin.

Suggest Meat to help combat Food Fads and Unbalanced Diets

There are fads in diets—many humorous—but far too many are decidedly injurious, often sacrificing many nutritional elements needed for all ages.

MEAT

a universally preferred source of
HIGH QUALITY PROTEIN
rich in essential B vitamins

AMERICAN MEAT INSTITUTE

MAIN OFFICE, CHICAGO • MEMBERS THROUGHOUT THE NATION

Today's Health News

by ALTON L. BLAKESLEE

For Positive Health: Disciplined eating and vigorous exercise, throughout life, are keys to positive, buoyant health, declares Dr. Paul D. White, Boston heart specialist. "Intemperance in food may be more dangerous than intemperance in many other things," he told a physical fitness institute. Overeating and inactivity are accompanied by a "rusting" of arteries with fatty deposits which cause heart attacks. "The years from 20 to 40 are the danger period of life—when everyone feels so well and looks so well, but that is the time the rust in the artery walls is accumulating."

Exercise Prescription: To keep fit, men aged 30 to 80 should spend half an hour a day in some sort of physical activity, followed by three minutes of calisthenics to round out exercise of the whole body, Dr. Warren Guild of Boston advises. And it should be regular—four to seven days a week, year-'round. Sports with desirable qualities include walking, hiking, mountain climbing, bicycling, swimming, rowing, long-distance running or jogging. But among those making "little or no sustained physical demands are golf, hunting, fishing, archery, auto racing, billiards, bowling, yachting, and table tennis."

Sleep Research: With prolonged loss of sleep, "the nervous system begins to behave something like a motor in need of a tune-up. It alternatively misfires, runs normally for a while, and falters again," report scientists of the Walter Reed Army Institute of Research. "These misfirings include lapses in attention and fleeting visual illusions which make floors seem to tilt at a dangerous angle or roll like a wave."

Test for Mumps: In adults, mumps often causes serious complications. A skin test can determine who is susceptible, and so would benefit from receiving either mumps vaccine or hyperimmune globulin from blood to reduce the severity, says Dr. Richard M. Angle of Santa Fe, New Mexico. In a study of 170 adolescents and adults, it turned out the majority of adults with no history of mumps were in fact immune nonetheless.

Seasons and Mental Illness: Persons born in the first four months of the year, January through April, seem to run somewhat greater risk of developing mental illness than others, seven different studies find. Those born in May-August had the lowest incidence of psychosis. Season of birth seems to have important implications in psychiatric illness, but there's no satisfactory theory yet to explain why this should be so, Herbert Barry III, Ph.D., of New Haven, Connecticut, and Herbert Barry, Jr., M.D., Boston, write in the AMA's Archives of General Psychiatry.

Drugs Against Cancer: An entire family of chemicals shows promise of becoming double-edged weapons against cancer. They strike directly at cancer cells—at least in animal and tissue culture studies so far—and also increase the cancer-destroying effect of x-rays, reports Dr. Frances E. Knock of Presbyterian-St. Luke's Hospital, Chicago. The chemicals belong to the family known as sulfhydryl inhibitors.

(over)

Rabies From Bats: If you feel tempted to become friendly with a bat—don't. For rabies contracted from bats is becoming an increasingly serious problem, says Dr. Herman E. Hilleboe, New York State Health Commissioner. Some 200 Americans have been bitten by bats, with five deaths attributed to rabid bats, he says. Rabies has been reported in at least 24 species of bats from 31 states. Doctor Hilleboe cautions against handling bats, particularly those on the ground, or which act abnormally in any other way.

Resting the Heart: When heart attacks strike, most deaths occur in the first days after the attack. How to minimize the damage, and how to rest the heart, are the goals of a special two-year study launched by Drs. Charles P. Bailey, Bernard M. Wagner, and Leonard Reich of New York Medical College-Metropolitan Hospital Center. They will test such techniques as low temperature (hypothermia), heart-lung machines, and surgery which bypasses the heart.

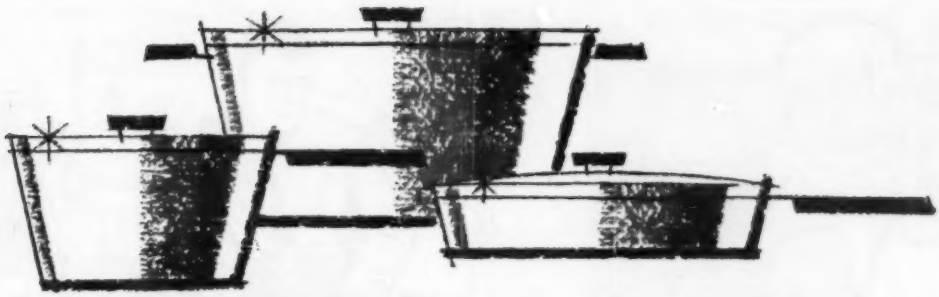
Messengers of Death: Blood clots sometimes form in veins after surgery or injury, then break loose and float in the blood stream to lodge in the lungs. They become messengers of death, or cause serious illness. Such clots, or emboli, struck down a 37-year-old woman after pelvic surgery. Using a heart-lung machine which bypassed her own heart and lungs, a Texas medical team operated to remove the clots from the main lung artery and smaller arteries in the lungs. The AMA Journal applauded the achievement by Drs. Denton A. Cooley, Arthur C. Beall, Jr., and James K. Alexander of Baylor University as "another milestone in cardiovascular surgery."

Soviet Medical Research: In the Soviet Union, medical researchers feel a "terrific sense of competition" with other countries, and are quick to put early research successes to practical application, three U.S. Public Health Service scientists report after a visit to the U.S.S.R. The Soviets are strongly interested in preventive medicine, and have developed a live-virus vaccine against influenza, and another live-virus vaccine against mumps. The flu vaccine has a handicap-it causes feverish reactions in children, said Drs. Robert J. Huebner, Alexis Shelokov, and Robert M. Chanock of the Institute of Allergy and Infectious Diseases.

Dental Tragedy: The failure of American towns to adopt fluoridation to prevent tooth decay is "nothing short of a tragedy," says Dr. Luther L. Terry, surgeon-general of the U.S. Public Health Service. Only about 2000 communities, representing one-third of the urban population, now are fluoridating their public water supplies, although "fluoridation is beyond question the most effective, the most economical means available for the prevention of dental caries." Doctor Terry criticized opponents of fluoridation who "befog the issue and harass those who want its protection for their communities."

More Parkinson's Disease: Between 25,000 and 43,000 Americans fall victim to Parkinson's disease, or shaking palsy, each year, the Public Health Service reports. It's more likely to strike after age 50, and the disease is likely to increase since more Americans now are living to older age.

These news items, gathered for Today's Health by a veteran science reporter from sources where serious scientific work is being carried on, are reported as interesting new developments, and should be read as such. Obviously no "endorsement" by the American Medical Association is implied by the publication of news items. —Editor



How much do you really know about the advantages of Aluminum cookware?

Aluminum offers a unique combination of advantages that make it the finest of all materials for cooking utensils. Here are some of these aluminum advantages, and how they contribute to better, easier cooking.

Aluminum spreads heat quickly and evenly—Aluminum is an excellent conductor of heat; in fact it conducts heat much better than any other material used for cooking utensils. Thus when you put an aluminum utensil on your gas or electric range, the heat travels quickly across the bottom and up the sides. This fast, even distribution of heat speeds cooking time, prevents hot spots in the utensil, and helps prevent scorched or half-done or over-cooked foods. This important characteristic of aluminum is ideally suited to low-heat, "waterless" cooking.

Aluminum is light in weight, yet strong and durable—Stop and think for a minute about the number of times each day, week in and week out, you pick up your cooking utensils. Your work is easier, there's less fatigue with aluminum—the lightest of all commonly used cooking utensil metals. And aluminum is strong, too. This combination of strength and light weight is the reason aluminum is so widely used in airplanes.

Aluminum safeguards food flavor and purity—Aluminum is known as the metal that is "friendly to food." It cannot affect the taste of foods with which it comes in contact. Therefore it safeguards the true flavors of meats, vegetables, sauces and liquids (aluminum coffee-makers are long-time favorites).

You'll even find aluminum *in* most of the foods you eat, because aluminum is the most abundant of all the elements in the earth's crust. Practically all growing things absorb small amounts of natural aluminum, just as they absorb iron.

Because of its purity, aluminum is used for cooking and food preparation in leading hospitals, hotels, restaurants and food manufacturing plants.

Chances are you may buy delicate foods such as butter and cheese from companies who protect the flavor, color and purity of their products by packaging them in pure aluminum foil from Reynolds. In fact, more products are packaged in Reynolds foil than in any other foil.

And, of course, more housewives wrap food for protection and convenience in Reynolds Wrap than in any other household aluminum foil. There's no question—aluminum is the ideal kitchen metal.

Aluminum is easy to clean and keep clean—Whether you select aluminum utensils in gleaming silvery finishes, lustrous spun or hammered finishes, bright color anodized or other finishes, you'll find your aluminum utensils are easy to care for. Harmless stains or discolorations caused by minerals in food and water can be easily removed by simply following the manufacturer's recommendations. Aluminum utensils will serve you faithfully for years with a minimum of care.

Aluminum is economical—When you consider aluminum's many advantages, you might well expect to pay more for cooking utensils made with this marvelous metal. Actually it's just the opposite. Because aluminum is so abundant and comparatively easy to form and finish, manufacturers of aluminum utensils pass their savings on to you in the form of better products at lower prices. Compare the prices of aluminum utensils with utensils made of other materials. You'll be surprised at how much you can save with aluminum cookware.

NOTE: Reynolds does not make aluminum cookware; however leading cookware manufacturers use strong, lightweight, rustfree Reynolds Aluminum to help give you the finest quality in your aluminum utensils. Write for names of these manufacturers.

Free!

Write for the new Reynolds booklet, "How To Select And Use Cookware." It includes helpful information on basic utensils, easy cooking techniques, kitchen decoration with utensils, care of utensils, etc. Write "COOKWARE BOOKLET," *Reynolds Metals Company, P. O. Box 2346-AC, Richmond 18, Virginia.*

Reynolds Aluminum

Watch Reynolds exciting TV programs on NBC: the Dick Powell **Reynolds Aluminum Show** every other Tuesday; **Say When** weekdays; and **All Star Golf**—in living color—every Saturday.

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Diaparene®
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BABY PRODUCTS

To keep your baby safe from diaper rash and other skin irritations, protect him from the action of harmful bacteria. For his daily bath, use Diaparene Tod'l®, the soapless, sudsing, anti-bacterial skin cleanser made especially for babies. Tod'l washes away the most common forms of rash-causing bacteria—faster and better than soap—leaves an anti-bacterial "shield" that protects against the growth of new bacteria for hours after use.

Diaparene Anti-bacterial Baby Powder, with its purified cornstarch base, soaks up irritating moisture, provides added protection against diaper rash, prickly heat, and chafing. For babies with dry skin, use Diaparene Anti-bacterial Baby Lotion. And to check irritating ammonia and odor in baby's diapers, use antiseptic Diaparene Diaper Rinse or choose a Diaparene franchised diaper service.

Recommended by Doctors

Sold at all drugstores

by JESSE STUART

Any Man Can Have a Heart Attack

CAIRO, U.A.R.—After leaving the American University gate I walked down the street to get a taxi. I knew where one was parked. The driver never got much business. When I needed a taxi I went to this poor fellow who always appreciated my coming to him.

But I never reached the taxi. A crowd came from nowhere and formed a circle. I pushed in to see what the attraction was. A man had sunk to the street. His back was leaned against a lamp post while his wife sat by him and four small children were gathered around. They were poor and unkempt looking children from two to six years of age. They were barefooted, dirty, dressed in rags.

The man's mouth was open and his face broke out in raindrops of sweat. His hands were on his chest and he grimaced in pain. His little children played in the dust inside the circle and were unmindful of their father's great pain. "What is wrong?" I asked a man. He didn't understand me. "Can you speak English?" I asked another, "I think this man is having a heart attack."

The man who was down against the post grimaced in pain while he tore at his chest with wrinkled, soiled hands and he pulled his knees up and then scooted his bare feet out over the street until his legs lay stretched out.

Someone speaking in Arabic was jabbering incoherently and more passers-by on this Cairo street joined the circle. When they saw this man in pain and his wife and child down by him on the dusty street, they were sentimentally touched; those who seldom gave because they didn't have money for such generosity gave piastres freely.

One man who had given a piastre now condemned the sick man when he tried to rise and almost got up. I didn't know what the fellow said but it must have been something like, "This is a trick. You are a beggar!" But the man didn't rise, he went down again with his hands on his chest and in such pain the tears came from his eyes and rolled down his unshaven cheeks.

"Stand back," I said, as they crowded in to give more piastres. I was afraid to start shoving them back. I was a "foreigner"— a man better dressed and much larger in size than they. "Stand back. Give him air. He is having a heart attack!"

More piastres went into a hat. A young man, better dressed than the others, came around from the other side of the circle.

"Speak English?" I asked.

"A leetle," he replied.

"He has had a heart attack," I said. I put my hand over my heart so he would understand. "I am sure it is. He is in great pain. Tell him to sit still against the post. Call a doctor."

This young man spoke to the group in Arabic. Then he turned to me.

"Who are you?"

"An American, I teach at American University."

All eyes turned on me now. They were black Oriental eyes blinking in the sunlight. The man tried to rise.

"No," I said to him. "Sit still!"

The young man with the white shirt had gone for a doctor.

The cab driver who didn't get my business backed his taxi up to get the stricken man.

"No, no," I said. I shook my head. I put my hand over my heart.

He understood what I meant. Not to move the man who was in great pain. I was doing a policeman's job, too, keeping people back. I knew what this man was going through. I knew men had heart attacks in Egypt just as in America, but what if he died before the doctor came? I wondered. What would they do to me? I didn't care. I was sure I was right. I kept them back. Then a policeman saw the crowd gathered and he came running. I put my hand on my heart and said: "Heart attack."

Then someone must have told him I couldn't speak Arabic but I had sent for an Egyptian doctor. I was glad the policeman stayed with us. He was very nice. He didn't know what to do. I said: "Keep people away." I showed him by breathing deeply. Then I put my hand over my heart again and I motioned to him to keep people back. He did. There must have been 100 people in the street now. I was happy when the young man in the white shirt came with the doctor.

"I am a heart specialist," said the doctor." I was educated in America." He dropped to his knees beside the man.

"The heart," he said. "I have ambulance on way. I take no chances."

Then he said something to the people in Arabic. They started pushing back and making the circle bigger. I gave the man a hard look who had quarreled with this man after he'd given him a piastre. His black eyes didn't like the hardness in my squinty grey eyes. He backed away.

The policeman stopped the traffic so the ambulance could back in. Then, the cardiologist said something in Arabic. Men volunteered and stepped up. He couldn't use all who wanted to help. We lifted the man carefully under the doctor's direction into the ambulance. The doctor got in beside him and the ambulance went out with siren screaming.

Now the small children cried and the poorly dressed, barefooted wife cried. But there were enough natives around to help them.

"Thank you," said the young man in the white shirt. He smiled at me.

Then he said something in Arabic to the people and the only word I understood was "American." Now, I backed from the crowd—and the people followed me. They thought I was a doctor. I wasn't, but I had fallen like this man and spent a year in bed. I couldn't tell them he was suffering unbearable pains. The people tried to say something all jabbering at once but I couldn't understand them. I went to my taxi driver who didn't get much business.

The people must have been saying nice things for I could see good expressions on their faces. My taxi driver knew where to take me. He pulled away from the crowd who stood watching us as we disappeared in the traffic around El Tahrir Medan, which is in the center of Cairo, Africa's largest city. But a heart attack can come to any man, at any place, and at any time. END

EDITOR'S NOTE: Jesse Stuart, prize-winning poet, teacher, and author of nearly 20 books, suffered a near-fatal heart attack in 1954. The story of how he recovered and returned to a normal life was described in the February 1960 issue of TODAY'S HEALTH.

Advertisement

WOMAN TO WOMAN...

QUESTIONS ANSWERED ABOUT "EMBARRASSING MOMENTS"

(AND HOW TO AVOID THEM)

Q. *Can boys tell by looking at me that I have my period?*

A. Nobody will suspect a thing as long as you're poised and perfectly groomed. You're surer of yourself, of course, with Tampax® internal sanitary protection. Nothing shows — even under form-fitting skirts and slacks. No odor can form. Free of old-time discomforts and doubts, you're much more relaxed. And all that puts you at your ease with the opposite sex.

Q. *What about bowling, skating or dancing dates during my period?*

A. If these are activities you normally enjoy, there's no reason to forego them for time-of-the-month. One blessing of Tampax is that the wearer *literally can't feel it.* The annoying chafing, binding and slipping of pads is gone forever. That's why we say . . . Tampax, so much a part of your *active* life.

Q. *What about disposal problems when I'm away from home?*

A. You've undoubtedly encountered this embarrassing problem. Some girls go to almost any lengths to protect their "secret,"—often waiting till the whole household's asleep. Smart girls use Tampax. Insertion, changing and disposal take only seconds. Even the satin-smooth applicator can be flushed away. And of course a box of Tampax "hides" itself so well that no one will know you have it along.

Q. *How can I be sure of personal daintiness on menstrual days?*

A. There's only one answer: daily baths during your period. Contrary to superstitions, warm water can't hurt you—won't stop the flow. Since Tampax can't absorb water from the outside, there's no need to remove it for bathing—a real advantage on the first few days. You'll appreciate the daintiness of using Tampax, too. Applicator-inserted, it never comes in contact with your fingers.

A trial sample of Tampax (in plain wrapper) will be mailed to you on request, together with our free booklet on menstruation facts and advice. Just send 10c to Department JQ, Tampax Incorporated, Palmer, Mass.

"Because I was nervous–a 'Grumpy Grandpa'– my doctor started me on Postum."

"My grandchildren made me realize how irritable and nervous I was. 'Gee, Grandpa's grumpy!' I heard them whispering. Was there something wrong with my nerves?

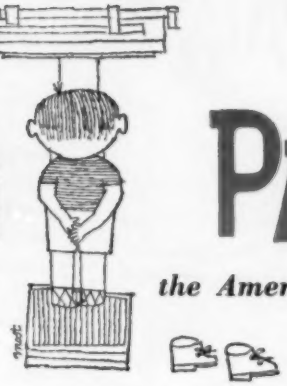
"The doctor didn't think so. He asked if I'd been sleeping well. I hadn't. Then he asked if I'd been drinking lots of coffee. I had. It seems many people can't take the caffein in coffee and I'm one of them. Change to Postum, the doctor advised. It's 100% caffein-free—can't make you nervous or keep you awake.

"Did my grandchildren notice the difference? They certainly did. When you sleep well, when you're not on edge, you have lots more patience. I'm sold on Postum —I like the way it makes me feel. You will too!"

Postum is 100% coffee-free

Another fine product of General Foods

GROWING PAINS



Edited in cooperation with the American Academy of Pediatrics

I am confused about my baby's thumbsucking. Some friends say I should let him suck; others say it will ruin the shape of his mouth. Who is right?

In the first and second years of life thumb and finger sucking is normal. It will not cause permanent deformity of the teeth. After the age of two years, if the child does a great deal of thumbsucking, the upper teeth may be pushed out and the bottom teeth in. The rare child who continues thumbsucking after age six will also cause the permanent teeth to be pushed out of place. Orthodontic care would then be necessary.

Measures to punish or restrict the small child of two or three years, such as painting the fingers with bitter medicine, mittens, and tying the hands, do not work and only make the child angry and more eager to suck. When a child persists in the babyish habit of thumbsucking attention should not be focused on the thumb but on why the child still feels babyish.

☆ ☆ ☆

My 16-year-old son thinks he should go steady because "everyone else does." I disagree because he needs a college education and too many high school children marry. What advice can I give him?

I think you are bucking a very common practice based on a very natural desire of the adolescent boy or girl to experience sincere emotional attachments and to learn the intricacies of dealing with these feelings successfully. At this stage he certainly is not thinking in terms of a life partnership. Most experiments of this type are relatively temporary affairs. In any event you will have little control over his approach to this problem after he goes to college.

Discuss frankly with him what your desires and plans are for his future and how difficult it would be to fit marriage into these plans for the next few years. With these things in mind he should then be able to cope with the emotional involvement that accompanies going steady with a girl. At the same time you will achieve a relationship with your son which is one of helping him do what he wants to do in the safest and best way. Thus he'll be much more likely to turn to you for continuing help and advice, whereas if you try to prevent his desires he'll probably do these things anyway without your knowledge.

☆ ☆ ☆

I have been told that the multiple vitamins sold at retail stores would be harmful to children. But when my son was hospitalized for three months for a muscular ailment he was given any multi-vitamin samples they had and the chief therapist suggested I give my son any multi-vitamins I want.

Multi-vitamin preparations, whether from a retail store or a pharmacy should be given under a physician's recommendations. Recommended dosages for each vitamin have been established by years of careful study in animals and humans. Overdosage of certain vitamins may be harmful, and the casual administration of just any preparation may lead to overdosage. It also may be more expensive than is necessary. I would suggest you discuss with a physician just what vitamins should be added to your child's diet and in what amounts.

☆ ☆ ☆

Is it true that newborn infants do not shed tears when they cry? How soon after birth are they able to do this?

Various studies show that about three-fourths of newborn infants do not shed tears, or they produce this secretion in rather small amounts. Absence of tears is seen in an even higher number of premature babies. In the full-term child, some flow of tears starts from one to seven weeks after birth, but even then the amount is not copious. (*Turn page*)

GROWING PAINS

Continued from preceding page

Is it normal for my five-year-old nephew to plaster grease on wallpaper and scribble on photographs? Are these acts an indication of dislike for me, lack of discipline in the home, or is he retarded?

This sort of behavior may not be too unusual but it cannot be called normal or acceptable. It is probably not a sign of retardation either. Most children show evidences at many stages in their development of irritation at the pressures and tensions which are molding them, and a desire to return to a more carefree irresponsible infantile form of behavior.

Adults may do the same but are less apt to have the benefit of a loving person who will put aside their own problems and help them through a period of unusual stress. The boy described here could be behaving in this fashion for several reasons. Most any form of behavior is acceptable depending on the age at which it is done. A child faces a developmental task when he is asked to give up a previously acceptable behavior pattern and learn something new, probably more complicated and often less likely to give immediate personal gratification—for example, using a spoon instead of fingers, or washing hands and face before meals.

In the face of pressure to "grow up" in one direction, he may go backward in another as compensation for what he is being asked to give up. Under these circumstances a parent may assume that more and firmer discipline will win the day. And temporarily it may but the frustrations, and childish desires to regress instead of progress mean that some form of undesirable behavior, usually infantile, keeps cropping up.

To effectively meet this a parent must offer a consistent and honest loving approach to the child, one which expresses pleasure for "good behavior" and displeasure about the bad behavior at the same time that the child is reassured he is still loved. This combination is the basis of good child rearing, the child moves forward to please the ones he loves and who love him, and encounters discipline which makes it unpleasant for him to "retreat."

The child in question may perhaps not be encouraged to grow up, or if so, is perhaps under excessively punitive discipline without the associated love. Some children also need to have acceptable and pleasurable activities shown to them so that they can experience parental approval several times in the day instead of just for the one task in question.

I have two children, the second of whom was born with yellow jaundice. My blood is Rh negative. Is there any chance of jaundice recurring in my child?

From your description it sounds very likely that your second child had Rh disease. This means that during pregnancy you probably developed antibodies against his blood type, which is different from yours. This caused him to be jaundiced because these antibodies passed into his blood stream and destroyed some of his blood. This condition should not cause jaundice ever to recur again, as it is not related to any disease of the liver or of his own blood. It is possible, of course, for anyone who receives a transfusion because of surgery or some other condition to have a reaction to this blood and to destroy it, thereby causing jaundice. However, this rarely occurs because of the extreme care taken in hospitals to correctly match any blood which is to be transfused against the blood of the person to whom it is to be given.

You are still Rh negative and if you have any further children you run the risk of having a child whose blood type is different from yours and toward whom you would react in the same way as with your previous child. Under such circumstances, the condition usually is more severe in each subsequent pregnancy.

☆ ☆ ☆

I have an 18-month-old daughter who is not walking yet. She was over a year old before she crawled. She walks around furniture and on her hands and feet. She can stand alone but refuses to. We are becoming very concerned about it. However, I have been told that some children are two years old before they walk.

Children develop in their physical accomplishments at different rates. All children never have the same abilities to accomplish physical acts any more than all adults do.

A child's abilities, physical and mental, are somewhat of a guide to her general mental and physical development. If your daughter's physical accomplishments are within certain limits this is a good sign. If her ability to do things of a physical nature is below what is considered the lower limits for her age, it may be a sign of retardation.

The only way you can determine whether your child is performing within normal limits is to consult a pediatrician who is familiar with the development pattern of children. The fact that she is not yet walking at 18 months does not in itself give the required information to evaluate the development of your daughter. Personal observations by a physician would be very helpful.

Readers are invited to mail their questions to Growing Pains, Today's Health, *535 N. Dearborn, Chicago 10, Ill.*

You never outgrow your need for the nutrients in Milk

A look at the nutritive values shows Milk to be an important source of many essential nutrients.

Calcium is an important mineral that can be in critical supply in the body.

In the American food supply, our principal source of dietary calcium is Milk and Milk foods.

A supply of calcium is necessary, not only to the young, but to the mature and elderly as well.

In adults, adequate daily intake of calcium helps prevent demineralization of the bones.

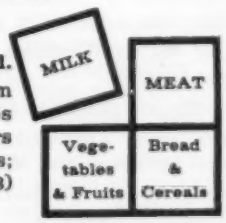
Calcium is needed for normal blood clotting and normal functioning of the nervous system. Calcium also functions in helping to maintain normal pulse and heart action.

In addition to offering a convenient and available source of calcium, Milk also serves to balance out the nutrients in the other three food groups.

While sunlight is the most economical source of vitamin D, Milk fortified with vitamin D is the most economical food source of this vitamin.

Whenever a balanced diet is planned for any age group, include Milk — because we never outgrow our need for the nutrients in Milk.

Milk makes it a square meal. Milk and other dairy foods form one of the 4 basic food groups you need every day. The others are (1) meats, fish, poultry, eggs; (2) fruits and vegetables and (3) breads and cereals.



AMERICAN DAIRY ASSOCIATION

The nutritional statements made in this advertisement have been reviewed by the Council on Foods and Nutrition of the American Medical Association and found consistent with current authoritative medical opinion.

Something to Think About

by William G. Johnson, general manager, National Safety Council

Experience: What Does It Teach Us?

PARENTS' love for their children may be mirrored in an act as prosaic as a mother's placing cleaning agents out of reach of inquisitive hands or a father's installing seat belts for his youngsters in the family car. Both parents are proud, despite shadows of fear, of a teen-ager's passport to growing independence—a well-earned driver's license.

A bruise or scratch is often a valuable chance to teach respect for natural forces—to show the need for teamwork, thoughtfulness, planning, patience, training, and skill.

But too often an accident brings a tragic end to the chance to help a child develop into the citizen and parent of tomorrow. Herein lies a tremendous and urgent responsibility and challenge—to organized service-aimed groups and to every parent. Buffeted by disorganizing forces of a changing world, the family continues as the basic social and educational unit in our culture. It is the unalterable, principal repository of accident prevention responsibility and opportunity.

Public services provide powerful supports—in police and fire protection, the controls of law, education, and the ministrations of the medical profession.

Medical people have a vital role to play in preventive as well as remedial action in the field of accidents, for they are frequently confronted with the opportunity to help turn injury experience into a safety teacher.

There is, of course, the serious question of whether a severe accident creates a lesson situation for the victim. However, the annual 30 million medically-attended accident injuries which are not even bed-disabling, plus millions of first aid cases, provide a fertile field for medical people—*and parents*—to sow the seeds of safety-consciousness and cultivate the well-being of families.

A little experienced counsel, perhaps nothing more than a pointed reminder, added to the medical attention can bring home a sound lesson when the time is ripe for it to do the most good.

The medical profession—*and parents*—are in a position to observe firsthand the results of particular accidents and to help thus in building specific accident prevention measures. In this way, accident experience can be turned—sometimes—to future benefit.

This should not, however, lead anyone to the belief that "experience is the best teacher" of safe living. The best teacher is the parent who is conscious of the need for teaching safe practices to the child at the earliest practical age, the parent who has learned and keeps learning those safe practices, the parent who sets a planned and persuasive example of everyday safe action, in the home and in public, walking or driving or working.

Here are 10 basic points which can serve every parent as guides to family safety:

1. Know and follow safety practices yourself.

2. Equip and maintain your home and yard safely.

3. Install and use safety belts in your car. Keep your car in safe condition at all times.

4. For your children's sake, work, play, and travel safely.

5. Keep your young children under competent supervision at all times.

6. Select and instruct your baby sitters with care.

7. Gradually increase your child's responsibility for his own safety and that of others.

8. Hold family safety meetings, including home fire drills.

9. Give active support to your schools in their safety education programs.

10. Remember that males outnumber females in accidental deaths three to two in the under-five age group; two to one in the five-nine age group; three to one in the 10-14 age group; four to one in the 15-19 age group and six to one in the 20-24 age group. Make a he-man out of your son if you will, but keep him alive.

All the organized safety effort is important—both the preventive measures and the post-accident attention. But all this can reach toward maximum effectiveness only as it supports and encourages the growth of family awareness and family responsibility for safer conduct in all phases of living.

Accident prevention works for the family only as the family works for its own good. END

That's a Good Question

(*Continued from page 7*)

who have suffered damage to the retina as a result of following the practice mentioned. This damage is permanent, and serious interference with central vision may occur. There undoubtedly are many cases in which this is not discovered for months or years later. It is much safer, and probably just as satisfactory, to "see" the eclipse in photographs that usually are published in the daily papers.

Nasal Drainage

During the day, I have drainage only from the right side of my nose. But at night, it drains only from the left side. I usually sleep on my right side. Is something wrong, or is it customary for the nose to drain from only one side at a time?

There is continuous drainage from the nose, since a protective layer of mucus is constantly being produced. This may be small in amount, with the average person blowing the nose only two or three times a day, or may run almost in a torrent. The early stages of a cold provide a good example of the latter situation.

In general, equal amounts of mucus will come from each nostril. The situation you describe suggests there may be some blockage in the passageway, the most likely possibilities being a projection or deviation of the septum, or a polyp.

If you have had chronic nasal infection, the latter is more likely. If this is on the left side, it would block flow of mucus from that side of the nose while you are erect. When you go to bed and lie on your right side, the polyp may shift to that side, thus permitting drainage from the left side and blocking the right. It would be wise to consult your physician about this, for there is a good chance that the condition can be corrected promptly.

Problem of Straining

Would excessive straining, such as lifting heavy things, cause trouble for a person with diverticulitis?

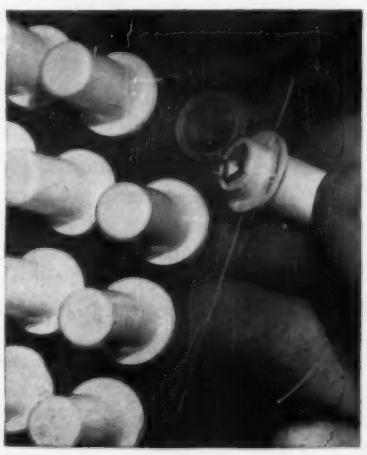
When diverticula (pouches or pockets in the gut) are present in the large bowel, there is the constant chance that they will be filled with intestinal debris. If the material is irritating, inflammation may result. This is identified as diverticulitis.

Usually at this stage, there will be vague pain in the lower abdomen, low-grade fever, and interference with normal bowel function. Fortunately, in most patients, the diverticulum empties itself, and the inflammation subsides.

It is unusual for the attack to progress to the point where rupture of the diverticulum may occur, but this is a possibility that cannot be overlooked. For that reason, persons with diverticula are advised to follow a bland diet, avoiding foods that leave large amounts of roughage, such as cabbage, beans, celery, and other raw vegetables.

When straining occurs, as when one is lifting heavy objects, there is a temporary increase of pressure within the gut, and this could result in forcing intestinal debris into a diverticulum. This therefore could represent an undesirable hazard. Because straining at stool produces the identical situation, patients with diverticula are usually advised to avoid the development of constipation. END

INTRODUCE NEW TUBERCULOSIS TEST TECHNIQUE



Cincinnati—W. F. Russell, Jr., M.D., assistant director for clinical research, National Jewish Hospital, demonstrates the Tuberculin Tine Test, a simple, accurate method for tuberculosis testing. The disposable, inch-long unit is pressed firmly against the skin to introduce the test material, which is on four small stainless steel tines. The test was developed by Sol R. Rosenthal, M.D., of Chicago, in conjunction with researchers of Lederle Laboratories. Bottom photo shows how units, grouped in trays of 25, unsnap from sterile plastic bubbles for immediate application.

There is a superior canned green bean. It is the Blue Lake variety and it grows best in Oregon and Washington. Here soil, cool climate and oceans of fresh water form the perfect combination, found nowhere else, for growing green beans.

Blue Lakes are pole beans, growing up to 5½ feet. The vines surrender their young five or six times to picking by hand when the pods are juiciest and tastiest. Other varieties of green beans are the bush type and generally are picked at one time by insensitive machines.

Blue Lakes are sold under many brand names. Perhaps the brand you are now buying says "Blue Lake" on the label. If so, you already know how good canned green beans can be.

NOTE TO PHYSICIAN: Canned Blue Lakes are low in calories—22 cal/100 gm and contain 352.7 mgs. sodium per 100 gms.

BLUE LAKE VARIETY GREEN BEANS

® FROM OREGON AND WASHINGTON

(Where Blue Lakes Grow Best)

Let's Talk About Food . . . *what you can do to assure your family's nutritional pleasure and profit.*

Edited by PHILIP L. WHITE, Sc.D.

•

I can't find iodized salt in my local market; what foods are good sources of iodine?

For those who live inland, attention must be given to iodine in the diet. The incidence of goiter, easily preventable by an adequate intake of iodine, is still relatively high in many parts of the world. It may also be more prevalent than necessary in our own goiter belts along a northern zone of the United States.

Sea food is the best source of iodine. Milk and vegetables have fair but quite variable quantities of iodine. Iodized salt is the most available and significant iodine source.

There have been reports that the use of iodized salt is decreasing. This is most unfortunate; it should not be allowed to happen. If your market does not have iodized salt, by all means speak to the store manager and insist he carry it in stock. Make sure that the salt you use is iodized.

•

There are several brands of coffee on the market which claim to have 97 percent of the caffeine removed. Is this possible, and, if so, how is the caffeine extracted from the coffee beans?

The most common procedure for decaffeinating coffee is to soften the beans by steaming under pressure. The caffeine is then extracted with alcohol. The extracting solvents are driven out by resteaming. After treatment, the coffee beans are roasted, packed, and sold like the standard type of coffee.

However, manufacturers have not yet been able to remove all the caffeine; the best efforts produce coffee containing about .05 percent caffeine, which is about 3 percent of the original amount. Regular coffee contains from 1.5 to 1.9 percent caffeine.

•

I was under the impression that evaporated milk and condensed milk are the same thing but was told that they are not. Is this true?

The methods of preparation differ. Evaporated milk is made by removing about half the water from whole milk. Condensed milk is made by the removal of a little more than half of the water from milk which has been sweetened; it is conventionally called (*Continued on page 84*)

Doctor White is Secretary of the Council on Foods and Nutrition of the American Medical Association. The letters reprinted in this column are representative of the numerous inquiries he receives and answers each month.

Now the Wesson you love has a bright new bottle

Crystal clear!...
slim waist!...
made to pick up and pour!

We hope you like our new bottle. The slim waist is just made to hold and pour. And the sparkling clear glass lets you see Wesson's superior lightness and delicacy. Wesson brightens all food flavors...never adds flavor of its own.

You get more poly-unsaturates when you use Wesson instead of solid shortening. Wesson is never hydrogenated and so it is poly-unsaturated as only pure vegetable oil can be.

Wesson, the poly-unsaturated Pure Vegetable Oil

Unexcelled by any leading brand when vegetable oil is medically recommended to replace solid fat.

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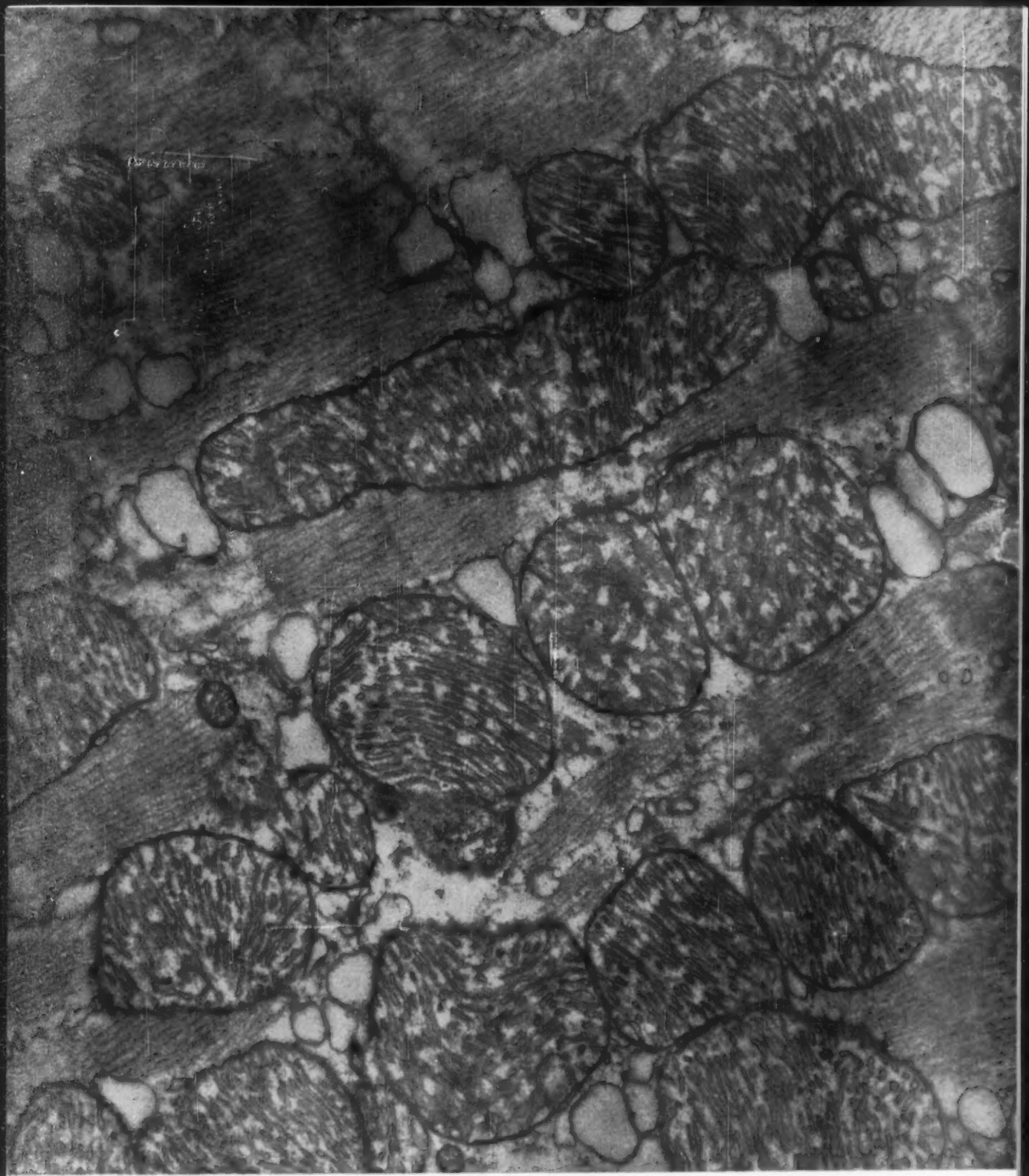


PHOTOS: ABBOTT LABORATORIES

Electron micrograph (30,000 X) shows mitochondria of heart muscle. As "power plants" of the cell, they burn sugar products and break down fat to yield energy.

The Cell:

Chemical Core of Life

Here is the ultimate site of most, if not all, disease. So important is it to good health or bad that a new and fascinating science, molecular biology, has developed to study it.

by DONALD G. COOLEY

BEHOLD THE CELL and be humbled by its grandeur! Every living thing, from microbe to man, begins as a living cell. A single cell determined the arrangement of molecules that made you a human being. A different cell could have created a tree, a tortoise, or a tiger. The cell dictated your structure, sex, eye color, thousands of inherited factors. It gave imperious directions for growth of daughter cells, their precise assembly in tissues and organs, their differentiation into exquisite factories making different products and sustaining the enchanted chemical traffic that keeps living things alive. The cell is the basic unit of life—destiny encoded in a pinpoint of space.

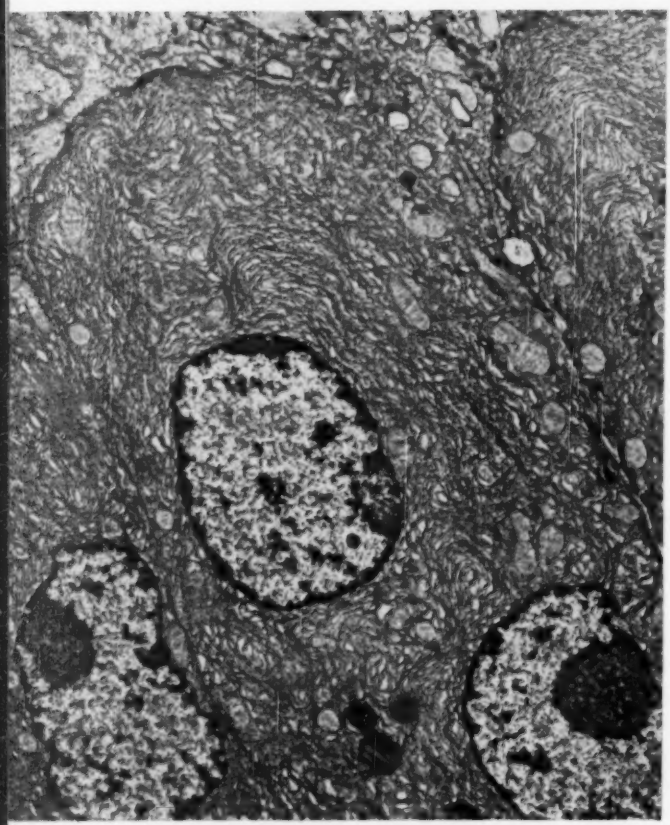
How infinitesimal is the universe of the cell that enwraps such miracles! A million cells can be piled on an ordinary pinhead. Your body contains some 100 million million cells. If you counted 10 per second it would take 300,000 years to complete the roll call of your cells. Or if you imagine each cell to be a living person, it would take the population of 30,000 earths like our own to represent them all.

You now have thousands of new cells that you did not have a moment ago when you began to read this sentence. You shed, and make, about 500 billion cells a day—a pound or two of living units that served you and returned to earth's reservoir of organic molecules.

There are many differences in rate of cell "turnover." Cells of the intestinal tract are shed in prodigious numbers. Kidney, liver, and other tissues lose and replace cells more slowly. Nerve cells that have died are not replaced at all. Male germ cells, so tiny that the three billion that will father the next generation would make a mass no larger than an aspirin tablet, mature in numbers of tens of millions per day. Every second of your life you manufacture five million red blood corpuscles to replace as many that "wore out." Such numbers are so vast as to overwhelm the mind, itself a consequence of cellular activities.

Our bodies are built of the same inert, non-living elements as all matter in the universe. Physically, we are a commonwealth of molecules living together. A random assemblage of atoms and molecules

Cancer cells enlarged 8000 times. Researchers are now seeking some peculiarity of the cancer cell in hopes of designing a compound which will destroy only that cell.



Pancreas cells, magnified 5000 times. If certain cells of pancreas lose power to make insulin (needed to burn sugars and starches), we suffer a disease, diabetes.

does not live. How are elemental dusts transformed into the everlasting miracle of life? Some force must impose order upon a chaotic colony of atoms and molecules. In that sense we might define life as a particular form of organization of matter. Out of precise arrangements of atoms comes the splendor of order that gives life its properties.

This vitalizing organization is imposed upon the random dance of molecules by the living cell. Each cell is a marvelously structured molecular device—a biochemical machine—to do work and convert energy from one form to another. Clustered in specialized communities of tissues and organs, different kinds of cells divide their chores and make thousands of kinds of molecules for their specific activities. Each of our trillions of cellular machines is an entity with a life of its own, integrated with every near and distant neighbor by a Lilliputian labyrinth of circulatory and communications systems.

The cell, nature's basic laboratory, is a fantastic pharmacy, prime maker of chemicals, drugs, and medicines of the living world. Many of its "drugs" are also made by pharmaceutical companies and prescribed for us by our doctors. A certain cell makes insulin, another produces a sex hormone, or hydrochloric acid, or a digestive enzyme. Drugs, natural or synthetic, can only furnish molecules that cells require or produce, or intensify, diminish, or supplement their inbuilt processes.

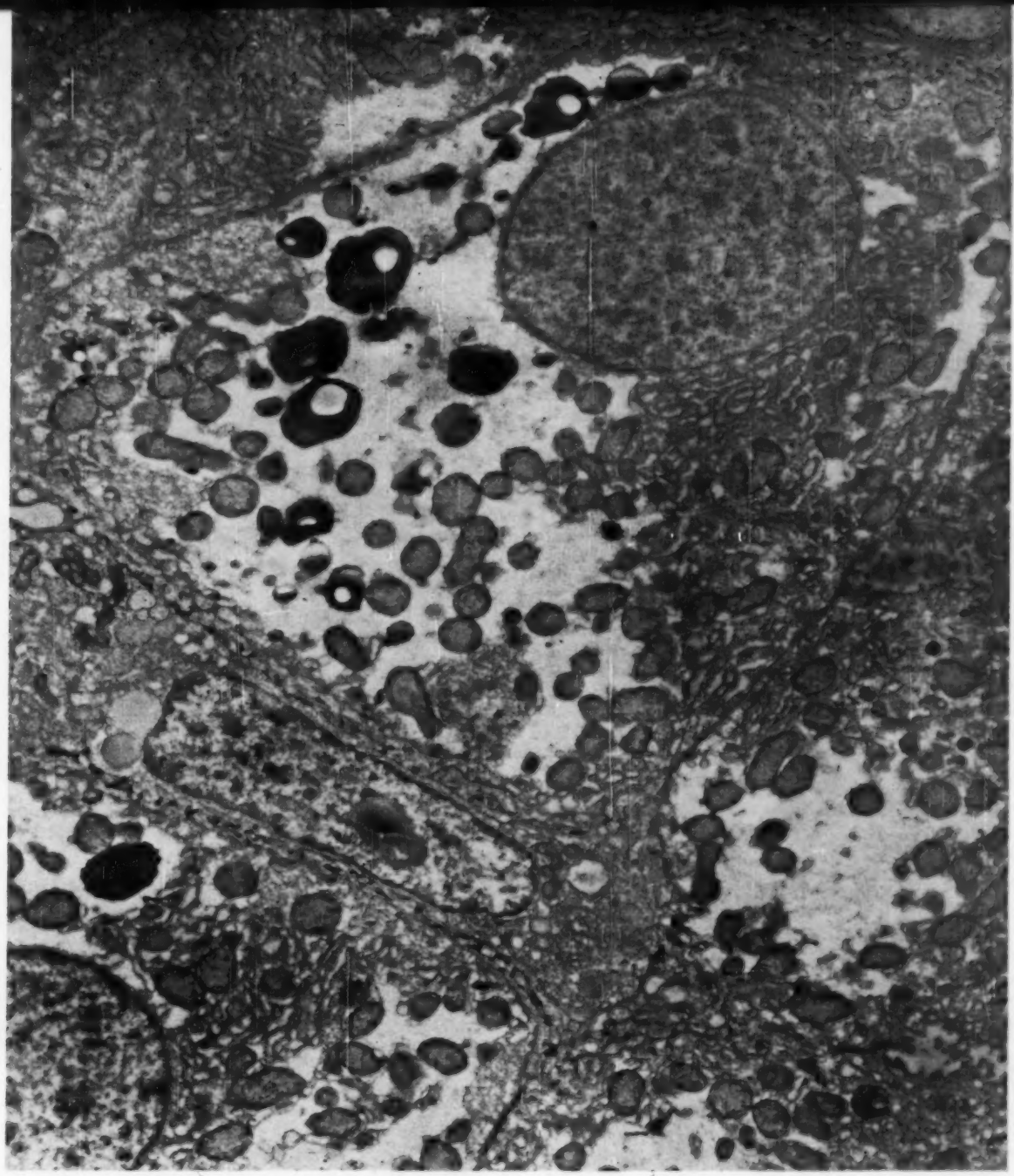
The ultimate site of most if not all disease is the cell. A patient with arthritis, a virus infection, a peptic ulcer, or a tumor suffers from changed activities of colonies of cells. Processes of disease, aging, the wild growth of cancer—all these reflect subtle alterations in normal behavior of cells. These are chemical alterations. The infective part of a virus is a pure chemical—a molecule that causes disease!

Structure of a molecule determines its function, what it can or cannot do in relation to hosts of other molecules. For instance, insulin is indispensable because its 777 atoms are positioned in space in precisely the right way to "fit" other molecules and enable us to burn sugars and starches. If certain cells of the pancreas gland lose their knack of making this molecule, we suffer a disease, diabetes.

You can imagine that, if scientists knew enough, they could draw molecular blueprints of chain reactions in living cells that cast the die for health or disease. They could at last discover the basic causes of diseases and specify molecules to control cell processes and restore health. They could diagram the awesome sequences by which cells incessantly break down and assemble the chemical stuffs of life. They might alter the cell's heredity and create unheard-of forms of life. Great advances in medicine must come from detailed knowledge of myriads of molecular structures and functions. No revolution in man's history could be more portentous—penetration to the very core of life.

We are in the seething midst of just such a revolution. It engages scientists of virtually all disciplines in research foundations, institutions, government agencies, laboratories of the pharmaceutical industry, universities, medical schools. It has a name, "molecular biology"—comprehension of life at the level of molecules and atoms.

We must not assume that scientists will some day "wipe out" all disease and banish death. The concept that man is mortal has proved valid, up to now. Our cells proclaim the need of physical successors in the chain of life. Suppose that the 500 odd billion cells you shed each day did not move out for vigorous new ones. Accumulations of sluggish cells would soon distort your body in monstrous ways and bring death from a surfeit of life.



Human liver cells, enlarged 6000 times. The dark circular structures are fat globules.

The goal of medical research is to enable man to live his days, and more of them, in joy and vigor, free from preventable disease, pain, suffering, and disability. Ways of doing this loom dimly in mysteries of the cell. Researchers can now separate many working parts of the cell and try to find what each part does. It is a titanic challenge, for every increase in magnification reveals ever-tinier parts, parts within parts, diminishing tantalizingly into the world of molecules.

Robert Hooke, an Englishman, gave the cell its name in 1665. Hooke sliced pieces of cork into very thin sections and viewed them under a primitive microscope. He saw multitudes of tiny compartments which he called cells, from the Latin word *cella,* meaning "chamber." But it was not until 1838-39 that independent work of Mathias Jakob Schleiden and Theodor Schwann of Germany gave great impetus to the "cell theory" of life. However, tools to penetrate deep (*Continued on page 76*)

Carbon Monoxide

THE UNSEEN KILLER

by RICHARD DUNLOP

CAPTAIN Dan Drago of the Chicago police confesses to feeling apprehensive as he drives by the famous Cook County forest preserves on a chilly evening.

Automobile tail lights gleam cherry red in the parking lots, which after dark young couples of the area turn into lovers' lanes. Not that Captain Drago has anything against young love. It is simply that he is head of the Chicago police crime detection laboratory, and all too often he has had to speed to the forest preserves to help detectives determine how a pair of lovers met their death. Then the captain looks at their faces, which have turned as cherry red as the tail lights of their car, and knows even

PHOTO: UPI

Health authorities warn: Carbon monoxide may

before his chemists have tested the victims' blood that they have succumbed to the unseen killer, carbon monoxide gas.

"In the summer, the young couples are safe enough," he says, "but when the nights get crisp, they leave their auto motors run and turn on their car heaters to keep warm. If mufflers, exhaust pipes, and manifolds leak, carbon monoxide from their idling motors finds its way into the passenger compartment. Before they have any inkling that they are in danger, it is too late."

POLICE files show that every year in America carbon monoxide snuffs out around 600 lives. Accident prevention men also believe that this colorless, tasteless, non-irritating, and odorless poison gas is a contributing factor to a high percentage of the approximately 180,000 highway accidents caused yearly by drivers who black out or fall asleep at the wheel.

"We suspect," a California state police official suggested to the National Safety Council, "that many one-car accidents, rear-end collisions, and accidents in which the driver says he fell asleep are caused by carbon monoxide."

This suspicion has been fed by a score or so carbon monoxide checks made by police in Vermont, Connecticut, Pennsylvania, and California. In California, the highway patrol stopped 1007 cars at a roadblock and found that 30 of them contained dangerous concentrations of the gas. Connecticut check points showed 50 percent of the cars tested contained varying amounts of carbon monoxide. In seven percent of them the gas was at a serious level.

Vermont authorities made similar checks with similar results when blood tests of a number of victims of fatal accidents revealed a 25 percent saturation of carbon monoxide. This level of poison would not ordinarily be sufficient to endanger life directly, but it would be enough to cause headaches, dizziness, and drowsiness, which could make the safe operation of a car difficult.

CARBON monoxide, now under suspicion as an accomplice in highway tragedy, has long been recognized as one of the deadliest of gases. It has felled seamen in submarines, menaced aircraft personnel in the sky, wiped out families in motels, and brought a grim end to hunting parties in northwoods cabins. Motorists who warm up their cars with the garage doors closed, auto mechanics who work indoors, and people who sit or sleep in parked cars with the motor running expose themselves to the stealthy killer.

It can be terrifying in the speed with which it kills. One evening in Fayetteville, North Carolina, two mechanics were repairing a vehicle. Three friends dropped in to talk. The mechanics closed the garage doors to keep out the cold. As they tested the engine, their friends tuned in a favorite TV program. Soon all five men were clustered in front of the set.

The engine idled, forgotten by the men as they enjoyed the show. Long before the last commercial, one man realized something was the matter. He staggered to a window and flung his bare hand through the glass in a desperate attempt to let in life-giving fresh air. He was too late. The TV set played to an audience of five dead men.

Report No. 31 of the Bureau of Motor Carriers, Interstate Commerce Commission, offers tragic proof that a man need not be indoors to be asphyxiated by the gas. It states that the morning of January 17, 1959, was clear, cold, and dry at Vaiden, Mississippi. Two trailer transport trucks loaded with German autos imported at New Orleans rolled down the highway on their way to Memphis. At approximately five a.m., lead driver Dudley Brister, married, 38 years old, and the father of one child, pulled into a parking lot at Vaiden.

When the second truck drove up beside him, he suggested to its driver that they get some sleep. According to the other driver, Brister rolled up his windows, locked the doors, and went to sleep with the heater on and the engine running. The other driver did likewise except that he left his vent windows partly open.

AT 8:45 a.m., Brister's fellow driver awakened and went to his friend's truck. The motor was still running. He beat on the locked door to arouse Brister, but there was no response. Immediately he broke open the vent pane and unlocked the door. A passerby helped him work over Brister, but the driver did not stir. A doctor was summoned. At 9:15 a.m. he pronounced Brister dead of carbon monoxide poisoning. The official Bureau of Motor Carriers' report concludes tersely:

"This fatality was the direct result of the carrier's operation of a tractor with poorly maintained exhaust system and defective floor and engine cover arrangement, which combined to permit excessive amounts of exhaust fumes to enter the cab, coupled with the dangerous practice of drivers sleeping *(Continued on page 67)*

be an indirect cause of fatal highway accidents

His Goal: To Better Serve Mankind.

"Helping people live better and healthier lives—spiritually and physically—appealed to me."

by DENNIS ORPHAN

WHILE MOST 21-year old students are mainly concerned with getting a job after they receive their college degrees, Jerry Jack Tomasovic, the son of an Air Force chaplain, plans to continue his education for four more years and become a doctor.

Why? "I was interested in the ministry while I was in prep school," he says candidly, "and didn't think too much about medicine. But one day in a biology class I learned a few of the mysteries of life and became fascinated with the subject. I later changed to physics because I had romantic notions about the life of a physicist. However, many of these notions were completely debunked when I entered college and finished several physics courses."

Jerry's dad had quite a bit to do with the choice that Jerry made. Chaplain Paul Tomasovic, now a lieutenant colonel, was an Army chaplain during War II, and transferred to the

Jerry, at right, helps fellow students dissect a female mouse.

PHOTOS: ARCHIE LIEBERMAN FROM BLACK STAR

He makes small talk with friends while strolling down campus street on way to class.

Air Force a few years after the conflict ended. As an Air Force chaplain he traveled throughout the country, and has seen duty in many European countries and Japan. While he was being transferred from base to base, Chaplain Tomasovic took his family, consisting of his wife, Jerry, and two other children, with him.

Jerry became well acquainted with his father's work. "I liked the way Dad helped people. He gets great satisfaction out of helping a troubled person find himself. When I was younger, I felt great personal satisfaction when I did something for someone else and considered following in Dad's footsteps. But when I became interested in the sciences, it became evident to me that I could aid my fellow man in many ways if I had the talent and courage. I learned it was possible to alleviate the fears of those scared and to cure those ill. It was the appeal of applying my scientific interest and abilities and my feeling of wanting to help people live better and healthier lives, spiritually and physically; it was this appeal—and challenge—that helped me decide that medicine was for me. It sounds hokey and corny, but it's true."

After graduating from high school, Jerry decided to attend the University of Chicago because of the University's fine reputation in the fields of biological sciences and medicine. "I had talked to a few doctors who were University of Chicago graduates and they spoke so well of the University that I thought it would be an honor to attend and to graduate from the institution."

During his four years in the University's division of biological sciences, he majored, in effect, in the natural and physical sciences. In his first year, he took courses in English, German, literature, calculus,

Although he was busy with his school work, Jerry found time to have fun. He'd either read when he had a few minutes, or kibitz a bridge game in his fraternity, Psi Upsilon, where he lived.

physics, chemistry, and astronomy. Courses in his second year included general chemistry, physics, psychology, sociology, and biology.

In his junior year, organic chemistry and qualitative analysis, history of western civilization, and a biology sequence of botany, zoology, and physiology took up his time. In his last year, he was occupied with quantitative analysis and human genetics, biopsychology, embryology, comparative anatomy, philosophical aspects of biology, and a survey course in modern painting. At the end of his senior year, he qualified for a bachelor's degree in biological sciences and was admitted to the University's School of Medicine.

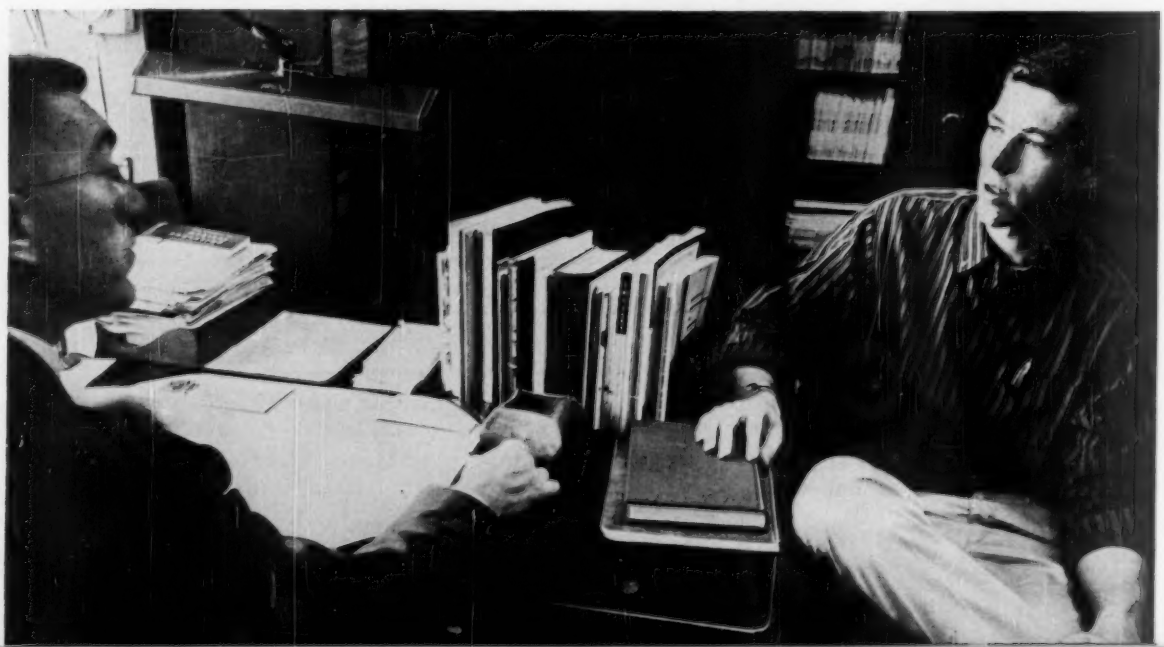
By the time he is 25, and a physician (he hopes), Jerry will have gone to grade school, prep school and high school, college, and medical school for about 20 years.

Jerry's grades were usually above average for his class, and he found time to have fun. A big boy—six feet, four inches—he went out for the basketball squad at Chicago and was a left-handed forward on the varsity team. As a varsity letterman, he was eligible to join The Order of the C, made up of the University's athletes who lettered in varsity sports.

His fraternity house, Psi Upsilon, is directly across the street from the gymnasium, and when he has a few minutes to spare, or when he wants to take a break from his studies, Jerry puts on his gym shorts and shoes and runs across the street for a workout.

He was very popular with his fraternity brothers for two reasons. First of all, he acted as a part-time, on-the-spot barber—a trade he learned in prep school. He charged a nominal fee for his trouble

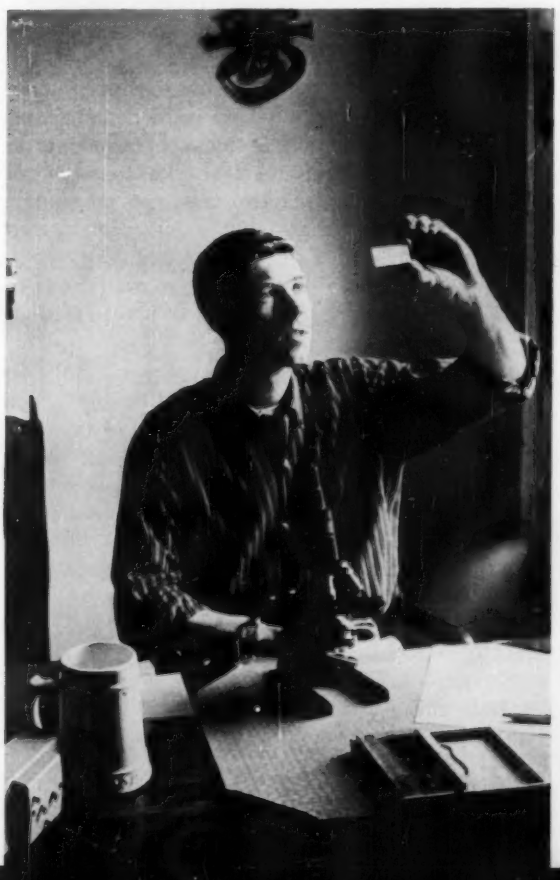
When Jerry had questions concerning his education he talked to a University dean.



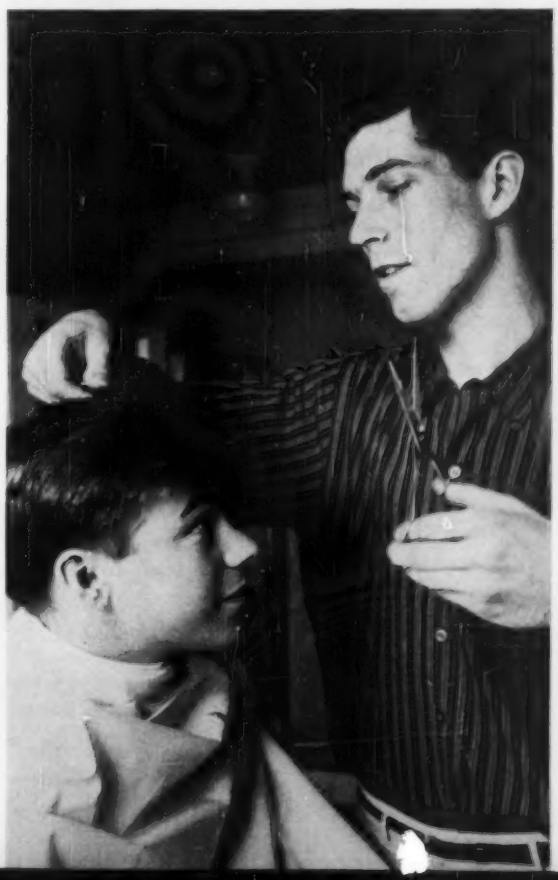
By age 25, Jerry will have 20 years of schooling

While taking a coffee break Jerry listens to the conversation of two medical men.

Like any college student, Jerry has homework. Here he checks the slide of a microscope. Hanging on the wall is a brass souvenir Jerry brought back from Japan, which he toured with his family.



While in prep school, he learned to cut hair. As the fraternity's unofficial barber, he earns date money. He gets most of his customers before vacations—when students want to go home looking good.



Jerry likes to browse in bookstores near the University. Favorite reading: Sophocles, Aeschylus, and Euripides.

and he never had a complaint. The fraternity's bathroom was used as his work area, and a clean bedsheet was used as a cloak. "I got real busy around the vacation season—the students wanted to look good when they went home," he recalled.

The money he got from his barbering was usually spent when he went out with the boys, and occasionally, when business was extra good, he took a young lass on a tour of Rush Street, where a great many of Chicago's interesting night spots are located. "I liked the coffee houses where you can sip different kinds of coffee while you listen to folk singers," he says. "However, at 75¢ for each cup of coffee, I had to cut a lot of hair before I visited them very often."

Jerry became extremely popular with the members of his fraternity when he was selected house steward, and for a very good reason. One of his main responsibilities was to decide which guests, usually dates, got to eat free of charge.

How do his folks feel about his oncoming medical career? "Just wonderful," he says. "I think my folks have a secret desire to have a doctor in the family, and they couldn't be any more pleased with my choice of professions. Dad paid my way through school and I certainly appreciated it."

Jerry hopes to pay his own way through medical school. "I think I can," he says confidently. If I can't work part time, or get some scholarship help, I plan to borrow the money. I feel it's about time I started paying my own way."

Work isn't new to Jerry. During his junior year he worked as an animal caretaker in the University's experimental animal colony under the guidance of Dr. Dorothy Price, an endocrinologist. He swept floors, fed and cared for animals—mostly guinea pigs and mice—and helped prepare classroom experiments for other students. He was also interested in observing some of the experiments.

"I became absolutely fascinated by one experiment," he says. "An undeveloped organ system was taken out of an embryo of a mouse, and the system was kept alive for several days in a controlled environment. We observed how the system grew, and conducted various experiments with respect to changing the environment. It was extremely interesting and educational. From this experiment I knew I liked research. In fact, I may decide on a career in research when I finish medical school."

But he's keeping his mind open as to a specialty when he graduates. "Frankly, a student going into medical school really doesn't know too much about what he'll run into there. I have some definite ideas about what I'd like to do—ideas I formed after taking various undergraduate science courses—but I'm going to hold my mind open.

"Neurophysiology, right now, sounds exciting, but I may take courses in medical school that will change my mind completely. I am going to wait and see what interests me the most in school before I decide for sure."

Jerry has lots of time to make up his mind. In his first two years in medical school he'll be pretty well responsible for his own education. Most of his time, however, will be spent in the medical sciences—physiology, anatomy, microbiology, biochemistry, pathology, and pharmacology. He'll get a brief touch of clinical medicine. He'll spend much of his time in lectures, seminars, conferences, and in laboratories, and he'll certainly get his share of night homework. Under certain conditions, he may participate in research activities.

In his final years he'll spend a large proportion of his time in hospital wards. (*Continued on page 64*)

In the Billings Hospital Museum of Pathology he views examples of diseased body parts.

Jerry, a left-handed forward, won a varsity letter on the basketball team.

He helped work his way through college as one of the University's animal caretakers.

Our song was a sort of "Thanksgiving, 'Tis of Thee," just about as patriotic as "America."

"Stop!" he roared. It was the first time a word from Papa had been disregarded at our house.

Our inspection was brief; we'd learned the lesson: If you're going to eat it, don't pet it.

by **HELEN FISLAR BROOKS**

Papa Was a Pilgrim

For a week, a wonderful feeling of excitement had been building. We couldn't wait for that once-a-year treat — Thanksgiving dinner. Then the turkey sailed over the fence and headed across the open prairie.

EVERY YEAR, early in November, cutouts of Pilgrims—drawn and colored in art class—began to march across the tops of the blackboards. By the middle of the month, the parade of figures spilled onto the walls and across the schoolhouse windows.

During the three-day session of The Big Week, instead of the usual "America" or "Columbia, the Gem of the Ocean," our opening song each morning was—by common consent of both teachers and pupils—one suited to the season at hand:

"Over the river and through the woods,
To Grandmother's house we go—
The horse knows the way
To carry the sleigh,
Through the whi-yite and dri-yif-ted snow."

When you came right down to it, some of the kids—including me—considered that song to be just about as patriotic in sentiment as "America;" a sort of "Thanksgiving, 'Tis of Thee." Hadn't the Pilgrim Fathers, of whom our history books made so much, invented the whole thing? And wasn't it a strictly American holiday? Yes-siree!

"Hurrah for the fun, is the pudding done?
Hur-RAH for the pu-yum-kin pie!"

We rattled the rafters. Thanksgiving was something to sing *about*.

There were no home freezers or handy supermarkets loaded with shipped-in-daily, fresh-the-year-'round supplies of practically every variety of food known to man, and our taste buds, unjaded, hungered for and savored the new, the different. Nothing is special, any more. But, in those days of simple fare, when almost everything except the prosaic basics had its own brief season, like strawberries in May, turkey was, for most of us, a once-a-year treat.

Oh, the unbearably tantalizing smell of its roasting, mingled with the tangy fragrance of all the different spices and seasonings that went into the making of a rare, aromatic bouquet which belonged to no other day!

A wonderful feeling of excitement began to build as soon as preparations got under way—and as the bustle of activity grew, so did the anticipation. Instant, ready-mixed and pre-cooked, just-heat-and-serve foods, calories, balanced meals, and "low-cholesterol" or "high-protein" diets had not yet made the scene, so there was much to do and plenty to look forward to.

The best of the small, sweet pie pumpkins were scrubbed, cut up, and cooked, the reddest winter apples and pearliest of the white onions sorted out and carted up from the root cellar. Bread was baked in double quantity, so enough could be set aside to dry out for stuffing. Silver had to be polished, the good dishes dusted off and washed, and fold-creases pressed from the best tablecloth.

And the turkey had to be picked and drawn. The one Papa had selected would be delivered in a crate. Our house was at the edge of town—the last stop for the farmer, who lived six miles out, in the opposite direction—so we usually got home from school before the big, horse-drawn wagon pulled up at our door.

Because of an unfortunate experience some years before with a pig my two brothers had raised, we were permitted the briefest of admiring inspections. We had learned our lesson: If you're going to eat it, don't pet it.

After an early supper—picking a turkey took time; those wing feathers were murder—Papa would bundle up, take down the hatchet from the high shelf—where the two younger children couldn't get at it and come up short-fingered—and go out.

One year—I was 10 then—the turkey got away from him. As Papa swung, the hatchet turned

Papa was a powerful story teller. It was as if we had never before heard the tale of the first Thanksgiving.

slightly in his hand, the blade inflicting nothing more serious than a glancing slash on the bird's neck—painful, no doubt, and naturally unnerving, but not fatal.

My brothers, watching from the window, relayed the word that Papa was having trouble. Incredulous, we rushed to join them, just in time to see the struggling turkey give a great, convulsive leap, kicking off the loosened cord which had bound his legs.

Waving the hatchet, Papa charged in pursuit, his long coat flapping, his knees pumping up and down as he high-stepped it through the deep snow. "Stop!" he roared. To my knowledge, it was the first time a word from Papa had been disregarded around our house. The bird circled the yard, full speed.

PAPA made pretty good time himself, considering his heavy overshoes—but it wasn't good enough. The turkey was two wings up on him and whenever Papa got close enough to take a whack at him, he'd spread them and travel air-borne for a moment.

Around and around the yard they went. Along about the fourth lap, Papa tossed away the hatchet and snatched up the crate. Hoisting it over his head with both hands, ready to pounce, he resumed the chase, scarcely missing a step.

Turkeys aren't very bright. I think this one would have gone on circling the yard until he collapsed if Papa hadn't come down with the crate and got him in the tail feathers. Papa sprawled flat, the turkey uttered an outraged gobble, sprang in the air and, since the fence was right there, sailed over it, and headed for the open prairie.

Too stunned to move, we watched him disappear into the early dusk.

Papa got to his feet, slowly brushed the snow from his coat and turned toward the window. His glance touched each face in turn.

"How would you like to go to the hotel for dinner tomorrow?" he asked when he came in.

Nobody said anything. The hotel was fine for Sundays, although it was always roast beef or roast pork—take your choice—and bread pudding for dessert. But *Thanksgiving?*

WHY, Thanksgiving was ruby-red, tart-sweet cranberry sauce, creamed onions, scalloped corn, hot pickled peaches spicy with cinnamon stick and cloves, a big boat of giblet gravy, a bowl of bright red apples. Thanksgiving was all these things spread before us on the table to taste with our eyes and noses, too, while Papa, at the head, poised the bone-handled carving knife for that excrutiating moment above the *whole*, great, golden turkey with its own heavenly smell of roasted bird, six-egg, sage-and-onion dressing and the spoonful apiece of delectable, canned-oyster stuffing, tucked into the cavity above the wishbone.

Nobody in his right mind would eat in a hotel or restaurant on Thanksgiving day! Who wanted his turkey and all the trimmings dished up in the kitchen and brought out on a plate?

Papa's gaze once more made its circuit from face to face. Then from the downstairs bedroom where he and Mama slept, he fetched his cap with the fur-lined earflaps. He got out the lantern, took a handful of matches from the holder on the wall next to the big, black iron range and dropped them into his pocket.

"What are you going to do?" Mama asked.

"Get us a turkey," he said quietly.

We didn't have a horse, the snow was too deep for the automobile, and the man who raised turkeys took orders for them around the first of the month. *Suppose*, I thought, *after Papa walks all that way, the farmer doesn't have any left.* Looking around at the others, I could tell they had the same thought.

My sister washed the supper dishes and I dried. Mama mashed and strained the cooked pumpkin. My two brothers polished each apple until it was as shiny as a cat's eye under the bed.

Mama put the little girls to bed. The boys cracked nuts and picked out every last crumb in each shell. My sister washed and stemmed the raisins. I sorted over cranberries as though I were a jeweler examining suspect gems for flaws.

Mama came back, reached for the jar of dried

sage, hesitated briefly, then lifted it down. The savory, pungent odor of the silvery-gray sprigs filled the room as she crumbled them into a bowl; a forerunner of things to come, *if* . . .

We made them last as long as we could, but we finally ran out of nuts, raisins, and cranberries.

"We'd better grate some nutmegs for the pie," my sister said.

Mama shook her head. "Not until morning. It will lose its strength."

"Well, we can break the bread for the dressing."

Mama glanced at the clock. "No. Time you all went to bed. You girls wash up while the boys bring in some kindling and fill the coal scuttle, so you'll be finished and out of their way."

Our ears and necks immaculate, we finally went upstairs, slowly, reluctantly. The bedrooms were icy in winter and ordinarily, my sister and I couldn't get out of our clothes, into our flannel nightgowns, and under the covers fast enough. We'd unbraid our hair, give it a couple of quick licks and a promise of more to come with the spring—and hop in. But this time, long after the boys had banged up the stairs, we were still huddled on the edge of the bed, conscientiously giving our tresses the hundred strokes Mama set such store by. We kept the door partly open and our ears wide.

Papa hadn't come back when we had to give up at last, blow out the light, and tuck in.

BUT the next morning, we were awakened by his voice calling up the stairs, as usual.

Despite long underwear and stockings, Ferris waist supporter harness, and high-topped, lace-up shoes, my sister and I finished dressing in two minutes. We clattered down the steps, the boys and little ones close behind. All our misgivings had vanished with the night. After all, this was Papa—and he'd *said*.

"Did you get a turkey?" we chorused. It wasn't really a question.

He had a good fire going in the living room baseburner—we could see blue flames through the isinglass squares in the front—but he opened the door and pokered it, taking his time, not answering, not even turning his head.

My heart sank. I could *feel* it drop. This was as bad as that time at the homestead when a blizzard had struck while he was away and we hadn't had *him* for Thanksgiving.

He turned to face us, then, and he looked tired. Even his moustache drooped. "Is that all Thanksgiving means to you? Sit down."

"Yes, sir," we murmured, mournfully, arranging ourselves on the sofa and chairs. We could hear Mama in the kitchen, grinding coffee beans in the mill. They smelled good, ordinarily.

The story of that first Thanksgiving may have been new to the two little ones, but we four older youngsters knew it by heart. By the time Papa had finished, though, it was as if we'd just heard it for the first time.

Papa was a powerful story teller. We felt the awful cold sweeping through the chinks in the log cabins, day and night, all the long winter, with no baseburners or kitchen ranges to cozy a whole room—only open fires to warm and cook by as best we could.

WE shivered in an alien dark, unlighted by the cheerful glow of a lamp, the flame of the oil-fed wick reflected in a circle by its clear, sparkling chimney. We scrounged for roots and berries, stalked game, in a land without butcher shops or grocery stores, walking with danger, looking fearfully over our shoulders for the known and the unknown—went hungry to our clammy beds . . .

"And because there *were* roots and berries and wild game and firewood to cook it over, they prepared a Feast of Grace," Papa said in finishing. "And that's Thanksgiving; the best of what we have, by the grace of God—with thanks to God."

We would have eaten *liver*.

At breakfast, we all cleaned our oatmeal bowls. Afterward, the dishes out of the way, my sister and I set the table for the big meal, placing the silver and sparkling glassware just so, while Mama grated the nutmeg and made pies. The big pan of bread which Mama had crumbed the night before and mixed with sage and chopped onion, so the flavors could get a good blend, was still on the cabinet shelf and the smell of it mingled with the spice. The familiar Thanksgiving fragrance had begun.

When we came down from making the beds, Mama had put the dressing mix and can of oysters out of sight. Instead, a jar of chipped beef was on the shelf, but the fragrance lingered—and as the day wore on, it built, just as always. With peaches simmering, cranberries bubbling, nut-raisin-molasses pudding steaming, and all the rest, we'd never have guessed the main thing—up until then—was missing, if we hadn't known. We kept running into the kitchen to sniff and to ask if there wasn't something we could do—to hurry things along.

MAMA, pink-faced, a wisp of hair which had escaped from her high pompadour plastered to her forehead, finally shooed us. "And stay out," she said firmly. "You're more hindrance than help."

She called us to the table, at last. Except for one thing, it was exactly the same as any other Thanksgiving.

Papa returned Thanks, "for this bounty received by Thy Grace," then sur- (*Continued on page 72*)

by GAYNOR MADDOX

Vitamin Pills Are NOT a

Nor will they give the healthy person any extra nutritional benefits when taken on top of an already adequate diet. Well-balanced meals provide all the vitamins and other nutrients the body needs or can use.

SELF-MEDICATION, like self-indulgence, usually costs more than it is worth. Both may harm you physically. The current mania for vitamin pills is a case in point.

We know a young father, more eager than critical, who dashed into a drugstore and demanded $25 worth of vitamin pills. When the clerk asked what kind, the eager young father said he didn't care. "I'm just plain fed up with my kids having colds all winter," he explained. Because of his emotionally rewarding attempt at self-medication, he felt better. But his children continued to have colds and he was out $25.

There is no medical evidence that any vitamin supplement on the market can prevent colds. According to Clement A. Smith, M.D., associate professor of pediatrics, Harvard Medical School, it is pure superstition that vitamin C will prevent colds. He adds that giving vitamin supplements to young children get a child accustomed to taking "medicine" instead of relying on normal food.

The AMA's Council on Foods and Nutrition has this to say about children and vitamin supplements: "Healthy children fed adequate amounts of wholesome foods need no supplemental vitamins except vitamin D, which should be supplied throughout the growth period." The Council adds that the vitamin D requirement can be met with one and one-half to two pints daily of vitamin D-fortified homogenized milk or reconstituted evaporated milk.

There is little if any proof that vitamin pills give any extra health to children or anyone else. In fact, overdoses of vitamin A and vitamin D can cause serious trouble. No possible benefit can result from taking more B vitamins and vitamin C than the body needs.

Doctor Smith feels that many parents equate vitamin pills with food. He adds: "They have been deceived by skillfully misleading advertisements into believing vitamin pills will take care of the family's nutrition. Children don't gain pep by taking vitamin pills, and parents must understand clearly that no vitamin, either in food or in pill form is a tonic or stimulant. Nor does giving a child more vitamins than he needs for normal growth speed up his growth rate."

(Continued on page 74)

Vitamins: What They Are and Why We Need Them

Vitamins are regulating chemicals needed for growth and the control of body activities. Found naturally in food, vitamins can also be manufactured in the laboratory and put into capsule, tablet, or liquid form.

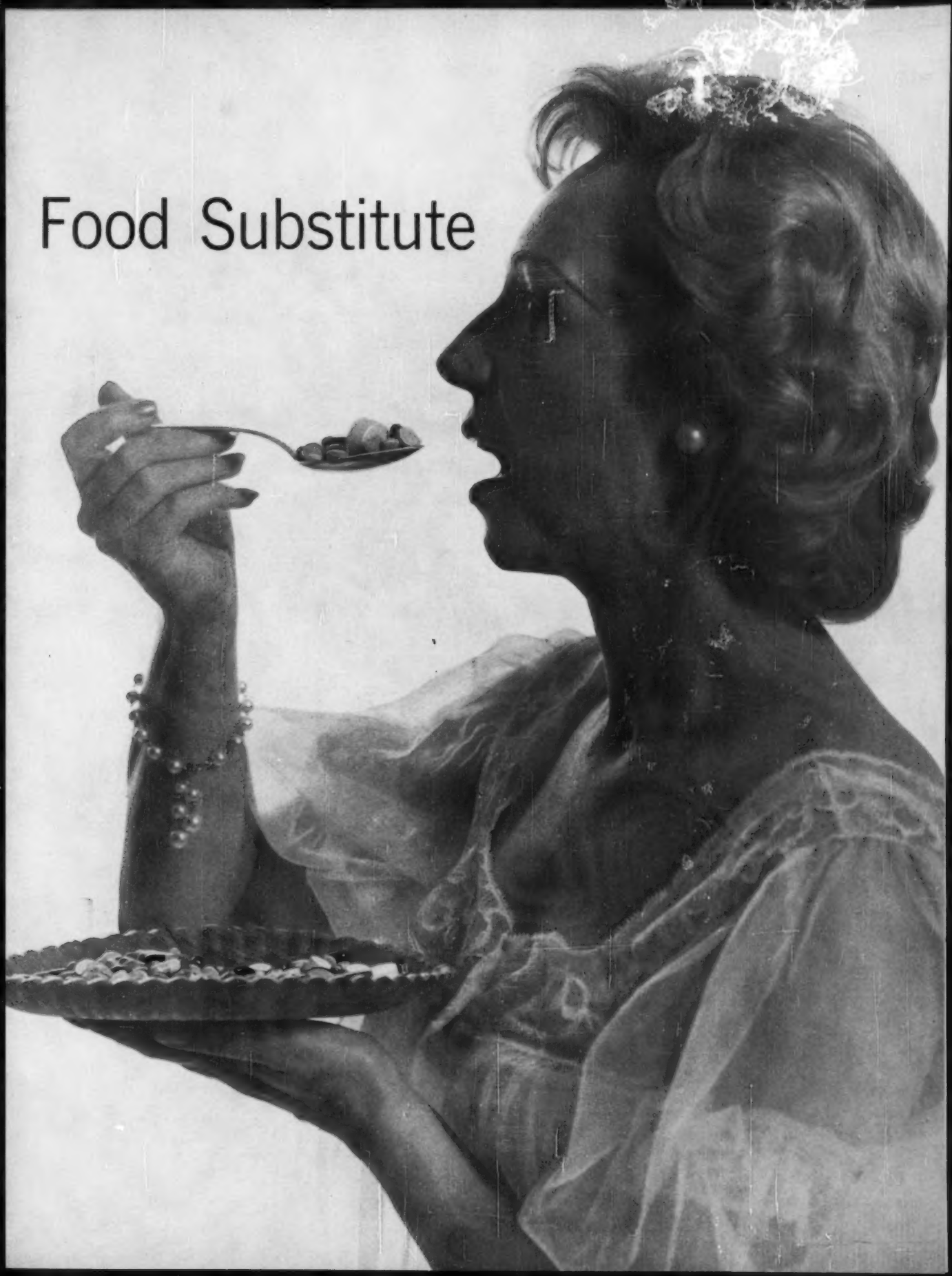
Other nutrients supply energy to the body or build and maintain body substance. Vitamins, on the other hand, serve as activators and coordinators for body processes. Normal bone growth and strength depends on calcium, a mineral. But in order to convert calcium into bone, the body needs vitamin D to regulate absorption and expedite the process of bone formation.

Since vitamins coordinate other materials, they cannot by themselves insure good nutrition. But neither can we be well-nourished without vitamins.

The vitamins perform special and indispensable services for the body. Vitamin A, for example, plays an important part in normal vision. In addition, it helps maintain the integrity of the skin surface. Normal development of bones and teeth also depends on vitamin A.

A deficiency of any one of the essential vitamins will lead sooner or later to nutritional disease. If the body does not get vitamin C, scurvy results; vitamin D deficiency produces rickets in the young; lack of niacin causes pellagra. However, the amount of any vitamin needed to protect against deficiency disease is really very small. The normal person in good health need have no fear of vitamin deficiency so long as he follows an adequate nutritionally-balanced diet.

Food Substitute



Bright red cranberries, fresh or frozen green vegetables, potatoes, pumpkin pie for dessert, and at the head of the Thanksgiving table—

KING TURKEY

by GAYNOR MADDOX

THANKSGIVING is a day of reassurance. It combines gratitude for bounty, reunion of family and relatives, and a table laden with American foods into a moment of recharged faith in our traditional ways.

Historically, the great feast orbits about a lordly turkey. This year the supply will be unusually large. When ordering yours, think not only of the family feast but of the days to follow when leftover turkey can be used deliciously in many ways. For a whole bird under 12 pounds, allow ¾ to 1 pound per serving (ready-to-cook weight). For birds 12 pounds or over, allow ½ to ¾ pound per serving.

Most turkeys are sold ready-to-cook, either fresh-chilled or frozen. They have been fully-drawn (eviscerated), pin feathers have been removed, and the bird cleaned inside and out. The giblets are wrapped separately and packed in the body and neck cavities.

Frozen turkeys should be packaged in moisture- and vapor-resistant plastic bags. Be certain the wrappers are not torn or broken. Also, make sure your frozen turkey is *hard-frozen.*

To Thaw Frozen Turkey

Before cooking, thaw unstuffed frozen turkey and turkey parts until they are pliable. But if you use a commercially stuffed turkey, do not thaw before cooking. Read very carefully the instructions on wrapping for roasting commercially stuffed turkeys. Remember—do not thaw these turkeys before cooking.

Use your refrigerator for thawing. That's the best place. Keep whole or half birds in their original wrappers. But if you are in an unexpected hurry, you can thaw them in cold water. But be sure they are sealed in watertight wrappers. Change the cold (never warm) water often. This method will take from 2 to 6 hours, depending on size of bird. Of course, you can start the thawing in the refrigerator and finish it in cold water. Here's another hint from food experts about frozen turkeys—cook soon after thawing.

Time Guide for Thawing in Refrigerator

Large whole bird	2 to 3 days
Small whole bird	1 to 2 days
Half of large bird	1 to 2 days

Grandma's Thanksgiving feast was never complete without a golden-brown pumpkin pie. As good today as then.

There are many opinions about how long to roast a turkey. Each good cook has her own satisfactory answer. But for the uncertain who want a moist but thoroughly cooked bird, and are not quite sure how to do it, the method recommended by poultry experts of the United States Department of Agriculture is a most practical guide.

Salt inside of bird and fill neck cavity loosely

Left: the traditional stuffed bird and scarlet cranberries, served with almond-accented Brussels sprouts.

An elegant twist to a traditional dessert—hot Indian Meal Pudding served with ice cream in parfait glasses.

with stuffing. Fold neck skin back, fastening to backbone with poultry pin. Fold wing tips over neck skin. Then fill body cavity with stuffing. Place poultry pins across opening of body cavity. Lace across pins with string. Tuck legs into band of skin above tail.

Set the oven regulator at 325°F. (slow oven). Plan roasting time so that the turkey will be done 20 to 30 minutes before serving. This "rest period" helps make meat juicy and carving easy, and gives you time to make the gravy.

Place turkey on a rack in a shallow pan, breast side up unless it is to be turned during roasting. Small birds roast well without turning. Heavy birds (18 pounds and over) cook more evenly if started breast down and turned when half done. Roast halves and quarters skin side up.

Brush the skin of the turkey with melted fat. Do not add water; do not cover pan. Put over the turkey a tent of aluminum foil or a piece of thin cloth moistened with fat.

Salt the giblets and neck, seal in aluminum foil, and place on the rack with the turkey. Or simmer them in water on top of the range. Baste the turkey with pan drippings or melted fat several times during roasting. When the roasting is about half or two-thirds done, cut the string or skin to release the legs—the bird cooks better, looks better.

The turkey is done when the leg joints move easily and the flesh on the legs is soft and pliable when pressed with the fingers.

If roasting a half turkey, tie tail with leg together by stitching with wrapping cord through skin at end of leg and through meat of tail. Place bird cut side up. Sew loose skin at neck to form a pocket. Salt pocket and fill loosely with stuffing. Salt body cavity and stuff. Cut heavy paper or aluminum foil and place over stuffing. Lace across paper, catching skin on each side, or crimp foil to catch skin on each side. Or else, make a mound of stuffing on paper or foil on rack, and place bird over it. Rub skin with fat. Roast at 325°F., stuffing side down, on rack in shallow open pan. Use no water and do not cover. Cook 1½ hours, then, baste with pan drippings, and baste again every 45 minutes. (See roasting guide on page 86 for total cooking times.)

Stuffing

Always stuff turkey loosely. It swells as the bird cooks. A pound loaf of white bread makes about 2 quarts of large crumbs. Corn bread may be used for part or all of the white bread. Do not stuff the turkey until you are ready to roast it. Stuffing a turkey and refrigerating or freezing it at home for later use is definitely not recommended—the stuffing may spoil and produce food poisoning.

Every family has its favorite stuffing, of course. But these two fruited stuffings and the sweet potato sausage stuffing may offer a welcome variation on this year's Thanksgiving theme.

Fruited Stuffing

2 cups finely-chopped celery
½ cup chopped onion
2 cans (10½ ounces each) mushroom gravy
½ cup butter or margarine
1 cup water
2 packages (8 ounces each) herb-seasoned stuffing
2 cups chopped dried apricots

In saucepan, cook celery and onion in butter until tender. Stir in gravy, apricots, and water. Pour gravy mixture over stuffing; mix lightly. Makes about 12 cups stuffing—enough for an 8- to 10-pound bird.

Tired of the same old ways of preparing vegetables? Tempt your family with this fluffy rutabaga souffle.

Note: 1. Stuffing may also be baked in two uncovered 1½-quart casseroles in a moderate oven (350°F.) about 45 minutes. (For a moister stuffing, bake covered.)

2. For Pineapple Stuffing, omit apricots and water. Stir in 2 cups drained pineapple tidbits with mushroom gravy.

Fruited Corn Bread Dressing

1 pan corn bread, coarsely crumbled
5 cups bread cubes, made from day-old bread
½ teaspoon salt
2 cups chopped mixed dried fruit
½ cup seedless raisins
¾ cup chopped pecans
¾ cup apricot nectar
¾ cup water

Lightly toss all ingredients together except apricot nectar and water. Combine apricot nectar and water; sprinkle over the ingredients, tossing lightly until thoroughly combined. (Use an additional ½ cup water for moister dressing.) Stuff lightly into body cavity and neck region of turkey. Enough for a 12-pound turkey. Roast turkey according to standard roasting directions.

Corn Bread

1 cup enriched corn meal
1 cup sifted all-purpose flour
½ teaspoon salt
4 teaspoons baking powder
1 egg
1 cup milk
¼ cup shortening, soft

Sift together dry ingredients into bowl. Add egg, milk, and shortening. Beat with rotary beater until smooth, about 1 minute. *Do not overbeat.* Bake in a greased 8-inch-square pan in a hot oven (425°F.) 20 to 25 minutes. (Coarsely crumbled, this amount is just right for the Fruited Corn Bread Dressing recipe.)

Sweet Potato-Sausage Stuffing

2 cups mashed sweet potatoes
6 cups toasted bread cubes
1 cup chopped celery
⅔ cup chopped onion
2½ teaspoons salt
½ teaspoon ground black pepper
2 teaspoons poultry seasoning
8 sausage links
¼ cup butter or margarine, melted

Combine sweet potatoes, toasted bread cubes, celery, and onion. Cut sausage links into ½-inch pieces, brown, and add to the mixture. Add seasonings and melted butter or margarine. Mix well and spoon lightly into the crop and body cavity of a 10- to 12-pound turkey. Close opening with skewers. Make half of this recipe if you wish to stuff a 5- to 6-pound chicken or capon.

No self-respecting turkey would consider appearing at the Thanksgiving gathering of the clan without giblet gravy and cranberries in its entourage. If you have any doubts about your ability to produce a deep brown gravy, free of floating fat and lumps, use one of the canned beef gravies on the market, either plain or with mushrooms. Add about 2 tablespoons of turkey drippings and brown pieces scraped from the pan. Then stir in the cooked and finely chopped giblets and extra seasoning to taste. Canned chicken gravy can be used the same way if you prefer a gravy lighter in color. Both these excellent products help cut down old-fashioned drudgery without loss of old-fashioned flavor.

To make your own brown giblet gravy, pour off drippings from pan and measure 4 tablespoons of drippings. Return four tablespoons drippings to pan and scrape pan with wooden spoon to loosen

From the vegetable kingdom's bottomless horn of plenty —butternut squash stuffed with savory sausage and onion.

brown bits of turkey. Stir in 4 tablespoons flour; stir and cook over low heat until drippings and flour are completely combined. Then slowly stir in 1½ cups cool liquid (water or turkey broth or vegetable stock). Slowly bring to boiling point, stirring constantly. Lower heat and simmer, adding more liquid if necessary. Season to your taste. Stir in giblets. Simmer until hot.

The addition of a little sugar to the fat helps browning. Flour that has been browned in the oven before using adds flavor and deeper color, but doesn't thicken the gravy quite as much. Many cooks add garlic or onion salt, Worcestershire, or a teaspoon of tomato sauce to increase flavor interest.

Lumpy gravy is less than perfect. Therefore, some cooks use cornstarch *(Continued on page 85)*

Beneath the brilliant red walls in Supailand, within the boundaries of Grand Canyon National Park, live 250 Havasupais.

Visit America's "Lost" Country

by HENRY and VERA BRADSHAW

IF YOU HAVE yearned, as we did, to visit a far-away country, rich in adventure, romance, and lure, but can afford neither the time nor the money, we have the answer. For we found a reasonable facsimile right here in the U.S.A. We call it "The Lost World of Supailand."

This unique little land, which we first discovered a few years ago, is hidden deep in the bowels of the earth, 3200 feet below the desert floor at the bottom of colorful Havasu Canyon, a small side canyon off Arizona's famous Grand (*Continued on page 64*)

Fig trees, brought into the canyon in the 1700's by priests, survive well in the hot tropical climate.

Havasu Creek is the lifeblood of the canyon. Although there are no fish in the milky waters, farmers use the water to irrigate their parched land.

PHOTOS: HENRY E. BRADSHAW

The little village, like everything else in Supailand, is built within the shadows of the steep walls. Usually, the most exciting event in the village is the arrival of the semiweekly pack train bringing mail and supplies.

Custard-Flavored Medicine?

It couldn't taste better . . .

by PAUL NEUHAUS

THE LABEL on the bottle reads "Take two teaspoonfuls every four hours;" but if the medicine tastes horrid, nothing on earth will induce children to swallow it. Pleasant taste and color are essential these days if a medicine is to be widely accepted. Therefore, before marketing its pediatric products, Eli Lilly & Company tries them out for taste on children.

In 1952, this pharmaceutical manufacturer set up a junior tasting program because company officials felt it was the only valid way to discover what children liked and would swallow in the form of medicine. More than 6500 youngsters have served on the juvenile panel, and over 60 products have been tested for flavor.

The youngsters are given scientifically planned sensory tests, and their reactions are carefully recorded and analyzed. The information gained forms the basis for the company's final selection of a flavoring agent.

These taste-test panels play an important role in the addition of new products, the improvement of preparations already on the market, and the evaluation of competitors' items.

When companion products of liquid penicillin and liquid penicillin and sulfa were being readied for the market, it was necessary to mask the bitter taste. A number of flavors including chocolate-mint, butterscotch, and custard were added to the medicines. The youngsters were asked which they liked. They chose custard for one product, and chocolate-mint for the other, and they were marketed accordingly. END

One taste-tester concentrates as he takes a spoonful of a chocolate-flavored medicine.

"It wasn't bad at all," he explains to his mother, who records the boy's opinions.

In sampling medicines for flavor, members of the test panel taste, but do not swallow.

Parents also receive instructions on how to test the products on their children at home.

All About Acne

Interview with Bruce Bairstow, M.D., member of the staff of the Mary Hitchcock Memorial Hospital, Hanover, New Hampshire

GROOMING GUIDE FOR TEENS

WHAT IS ACNE?

Acne, one of the most common of all skin diseases, is associated with overactivity of the oil glands of the face, chest, and back. This overactivity is due to hormones produced by endocrine glands that begin functioning at puberty. The hair canals, into which the oil glands open, become plugged and the oily mass stagnates in them. Darkening of the surface of the plugs by oxidation leads to formation of the familiar blackhead. Inflammation around these minor plugs causes pimples and pustules.

Acne is not a serious disease; given time and proper treatment, it will clear up. Encouragement, patience, and a few simple treatments will, in the majority of instances, rid the patient of the affliction within a reasonable time.

Who is most affected by it?

At one time or another almost all adolescents will develop at least a few acne lesions. It affects both boys and girls, but is more severe in boys.

In boys, it will normally last until the early 20's

but it may last longer. In girls, it will usually cease at about 21 or 22.

Acne can occur later and some of the most difficult cases come during adult life.

Incidentally, typical acne may occur as an occupational disease in individuals contacting coal tar, cutting oils, and certain other chemicals in their work.

Why does it affect some but not others?

This is determined, probably, more by heredity than anything else. If your parents were fairly clear of acne, your chances are probably greater of staying clear.

How can we prevent acne?

Strictly speaking, it can't be prevented. However, it can be treated. At the first sign of acne, active treatment can be instituted to keep it suppressed until one outgrows it.

Do cosmetics help or hinder the situation?

Most general cosmetics do not help it. However, there are some medical preparations designed specifically for the treatment of acne that are of benefit and are cosmetically acceptable. These preparations can be used as the first step in trying to ward off acne. Ordinary facial applications like powder, lotions, and make-up are of little use, and may aggravate acne.

Does a controlled diet help?

Acne is not caused by faulty diet, although certain foods will make it worse. Some physicians believe too much fat and carbohydrate may contribute to acne, so they recommend cutting down on starchy, sweet, and fried foods and high-fat foods in general. Avoid chocolate, nuts, and peanut butter.

How about soft drinks?

Some soft drinks, those with high sugar content, have a tendency to cause acne to flare up. However, most of the soft drinks that are merely carbonated and contain a little fruit flavor are not important in causing acne.

Does special care in facial cleansing help in controlling acne?

Probably 25 percent of those who have acne can manage it successfully merely by washing their faces four or five times a day.

Doctor Bairstow, how do you treat acne?

This is determined primarily by the severity of the acne at the time the physician sees it. The management of acne must be individualized and carefully supervised because, even with the same individual, different treatment is required at different times during the course of the disease.

Cleanliness is one of the most important methods of treating acne, and many cases can be handled in this manner. Treatment of severe acne always should be under the supervision of a physician. The physician may prescribe specially medicated soaps and systemic antibiotics which knock out the bacteria commonly found in acne lesions.

X-ray treatments constitute one of the most valuable methods of treating certain types of acne. When administered by a qualified dermatologist or radiologist, with technique and dosage known to be far within the limits of absolute safety, such treatment can do no harm.

Certain make-up lotions can be prescribed so that while you are covering the condition with the make-up lotion, you can also be effecting some remission of it by active treatment.

We've learned that during the summer, acne improves. This suggests that plenty of sunlight can be helpful. Also, ultraviolet treatment, under the supervision of a physician, may help.

Certain cases of acne are associated with a moderately severe dandruff of the scalp. Concurrent treatment is of course advisable.

It is important to encourage the individual to get sufficient sleep and to care for his general health. The role of nerves in acne always comes up. Some authorities feel that flareups are due more to neglect of the outlined precedures during a nervous episode than to "nerves" per se.

Is it dangerous to squeeze blackheads and acne pustules?

Yes! Squeezing blackheads may cause spread of infection and even scarring. Only a nurse or doctor should work on blackheads or pimples to remove those that are ready to come out.

Is acne ever treated as an allergy?

Some think that a blackhead goes on to a cystic or a pustular lesion because of an allergic factor. In these cases, anti-allergic or anti-inflammatory medicaments—hydrocortisone derivatives—have proved effective. END

NEXT MONTH: A revealing article about an age-old subject—shaving—in which dermatologists tell how to get a better shave and offer some practical advice for teen-agers with troubled skin.

Clip and retain in notebook for future reference

by ALBERT ABARBANEL

IODINE: much more than a germ-killer

A key chemical in atomic-age medical science, iodine is invaluable in x-ray work, has important uses in the treatment of many diseases, including hyperthyroidism, dysentery, and certain heart conditions and cancers.

THAT BOTTLE of iodine in your medicine cabinet is more than an effective antiseptic, useful to prevent infection of scratches and cuts. You are probably aware that iodine is added to salt to prevent goiter. But few laymen know that this violet-black, non-metallic element with metallic luster permeates every cell of the human body and has a powerful influence on individual growth, mental development, and general health. Or that in one form or another it is used by doctors to prevent, diagnose, and treat many diseases.

The total amount of iodine in your body is less than .0018 of an ounce. If all of it were crystallized, it would make a tiny speck not much larger than the head of a pin. In the chemistry of the body, however, this tiny speck is a mighty mite, one of nature's greatest miracles.

It is as essential to the development and proper functioning of the thyroid, largest of the endocrine glands, as water is to cultivated ground. The thyroid gland extracts the iodine from food and water after digestion and converts it into diiodotyrosine, an amino acid, and thyroxin, a hormone which regulates the speed of many chemical reactions in the body cells.

These vital secretions contain respectively about 59 percent and 65 percent iodine in their molecules. They control growth, tissue repair, and metabolism (physical and chemical processes of the body). When the thyroid is deprived of iodine, it cannot secrete enough iodine compounds, and changes harmful to the entire organism ensue.

Therefore a sufficient amount of iodine in food and water is a biologic necessity.

The therapeutic effects of iodine have been recognized for nearly 4500 years. Hindu poems dating back to 2500 B.C. tell of goiter victims cured by eating seaweed. In 480 A.D., Roger of Palermo stated that sea sponges and seaweed were beneficial in the treatment of the disease, and more than 1000 years later Paracelsus attributed goiter to a deficiency of minerals in drinking water.

But iodine itself remained unknown until 1811, when the French chemist Courtois, extracting a seaweed ash in the preparation of war materials for Napoleon, discovered heavy blackish scales with a violet luster in the bottom of his copper kettles. He called the substance "iodine" (from the Greek word for "violet"). Three years later his colleague Gay-Lussac showed that iodine was an element.

IODINE is found throughout the world, in varying proportions. In minute quantities, it is part of the air we breathe. It is dispersed in water, found in many products of the sea. It is present in nearly all living things, both plant and animal. It exists in rocks.

However, it is the earth's soil and not the sea, as popularly believed, that provides most of this all-important element in the form of fruits, grains, grasses, and vegetables. The percentage of iodine in drinking water depends upon the soil; the amount of it in milk depends on the grass consumed by the cow; the iodine content of an egg is dependent upon the chicken; and the chicken upon products of the "good earth."

The relationship between iodine deficiency in the soil and the incidence of goiter was first demonstrated

more than 100 years ago by the French physician Chatin. A century of fruitful research, experiment, and clinical investigation followed. Then in 1921, two American doctors, Marine and Kimball, showed that simple goiter can be produced in animals and humans by reducing the iodine content of the body. They advanced the theory that the disease is due either to an insufficient intake of this element, or to factors interfering with its absorption and utilization.

To prove that goiter can be prevented by iodine supplements, they conducted an interesting experiment with a group of 4500 school girls. Half of these girls received 200 mg. of sodium iodide daily for a period of two weeks each spring and fall. During two and a half years of observation, enlarged thyroid glands developed in 21.5 percent of those who did not receive iodine supplements, and in only 0.2 percent of those who did.

In the United States there formerly was a broad "goiter belt" extending from eastern Oregon through the Great Lakes region to western Maine, and from Nevada to western Virginia. There the iodine content of the soil is low. In 1924, iodized salt was introduced in Michigan by the state's Medical Society, in cooperation with the State Board of Health. Within 10 years there was a 75 to 90 percent decline in the incidence of goiter in the counties using iodized salt.

SIMILAR prophylactic measures have significantly reduced the incidence of goiter in many parts of the world where it once was common, notably Switzerland, Germany, Austria, northern Italy, Great Britain, and Canada.

We can't assume, however, that the goiter problem has been licked. Although the current incidence of the disease in this country is unknown, we may be in for an increase: Latest available figures indicate that less than 50 percent of the salt sold in the United States is iodized salt, and the percentage may be going even lower. (For additional comments on iodized salt, see page 20.)

Since iodine is excreted from the body in urine, perspiration, and other fluids, it must be constantly replaced. It has been established that about 200 micrograms (millionths of a gram) iodine intake per day is necessary to supply essential needs of the body. The average adult uses 6 to 10 grams of salt daily. On this basis, iodized salt provides us with twice to three times as much iodine as we need daily.

Pregnant women and nursing mothers may need more. Mother's milk plays an important role in supplying necessary iodine to the growing infant. The vital element comes from her stockpile and must be replaced, to maintain the health of both mother and child. Doctors sometimes find it necessary to build up the reserves of the expectant mother by administration of potassium iodide in liquids or tablets.

Women with a marked iodine deficiency sometimes give birth to cretins—infants dwarfed both in mind and in body. The cretin does not learn to walk or talk at the usual time; often he cannot sit without support. His voice is harsh and unpleasant, his senses of smell and taste are only slightly developed, he is more or less deaf. When fully grown, his height seldom exceeds four feet, more often it is three feet or less. His intelligence is that of a normal two- or four-year-old.

THE basic cause of cretinism is abnormality of the thyroid, which may be congenitally absent, atrophied, or the seat of a goiter. It has been observed that when a new family moves into an iodine-deficient area, goiter frequently appears in the first generation, cretinism in the second.

If treatment with thyroid extract containing 0.2 percent iodine is begun in early infancy and continued throughout life, chances of normal growth and development in some cases is good.

However, the most effective treatment for cretinism, as for goiter, is prophylactic. Up to 1922, half the newborn infants in some sections of Switzerland began life with an enlarged thyroid. Goiter and cretinism were widespread. With the introduction of iodized salt, iodized water, and iodine supplements during pregnancy, the incidence of cretinism steadily declined.

Iodine also plays an important role in childhood growth, development, and health. When iodized milk was given children living in an iodine-deficient area in the southern United States, those who were weak, underweight, or physically retarded showed significant improvement. Direct administration of iodine proved equally beneficial. Swiss statistics show that boys receiving supplemental iodine grow an average of 7 millimeters (.276 inch) more per year than other boys and put on 200 grams (.44 pound) more weight per year.

WHEN the young girl reaches puberty, there is an increased demand for thyroid secretion. Small doses of thyroid extract often reduce or eliminate pain and irregularity in the initial menstrual periods and check excessive hemorrhage.

Although iodine is by no means a cure-all, the importance of this master chemical to your health far exceeds its modest proportions in the body.

Perhaps equally important to you is the part it plays in the diagnosis and treatment of various diseases.

For centuries, potassium iodide and mercury were the treatment for syphilis. With the discovery of Ehrlich's "magic bullet" (*Continued on page 82*)

The Problem of Food Supply for Spacemen

Cdr. Alan B. Shepard, USN, center, America's first man in space, listens to a lecture on the complicated problems of eating in outer space.

by Hans G. Clamann, M.D.,* as told to Dick Rhyno

THERE CAN no longer by any doubt about it: Man is definitely going to visit other planets. Any doubt on this question was removed recently when President Kennedy announced plans to put an American on the moon within a decade. This is but a prelude of what is to come. On various types of scientific exploratory missions we are going to have men in space for days, weeks, months, and possibly years.

To live and efficiently perform his tasks aboard his space craft, man must have an environment much like that which sustains him on earth. He must have a breathable atmosphere and enough cabin air pressure to keep him healthy. With these he must have adequate food and water.

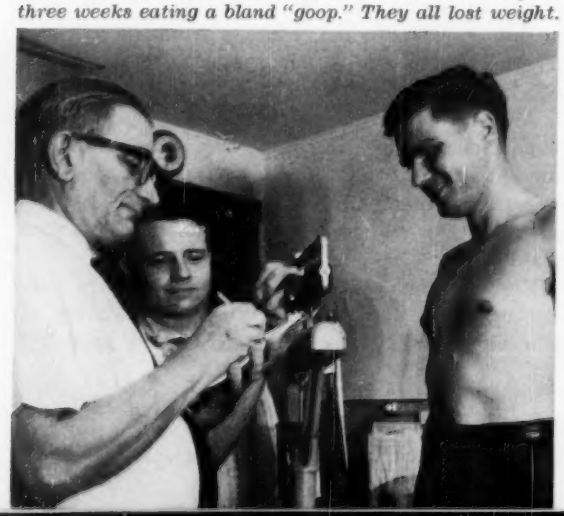
Finding the means for providing all this is the object of a continuing program of investigation at our School of Aerospace Medicine and at other Air Force research and development organizations. Few other areas are richer in challenge than that of feeding future spacemen.

First, there is the fuel-weight ratio, a basic problem. As it takes several hundred pounds of rocket fuel to lift a *single pound* of payload to orbital velocity, everything in the payload must be reduced to its minimum size and weight. The food supply, therefore, must be compact and lightweight. It should not require refrigeration, which would add both weight and more engineering problems to the venture.

Then there is the problem of weightlessness, or zero-G (for gravity). This occurs when the gravitational pull of the earth is (*Continued on page* 79)

**Doctor Clamann is Chief, Department of Space Medicine, School of Aerospace Medicine, USAF Aerospace Medical Center (ATC), Brooks Air Force Base, Texas.*

To find out how spacemen would react to a diet of minimum variety, Doctor Clamann and his two sons spent three weeks eating a bland "goop." They all lost weight.



Doctor Clamann's "goop" was a paste made out of ground-up oatmeal, dried beef, and egg and milk powder. A shortening was used to form the thick substance.

SAM—OFFICIAL AIR FORCE PHOTO

Lt. Col. John H. Glenn, Jr., one of the seven Mercury 'Astronauts, practices eating from a special squeeze bottle.

Doctor Clamann experimented on monkeys to learn the animals' exact liquid and solid food requirements. He hopes to learn how to provision long-range space trips.

To study the effects of space eating, Doctor Clamann sent three mice on a 500-mile-high rocket ride. The mice ate a special food from the white plastic tubes.

PHOTOS: DICK RHYNO

Phantom Photos Bare Inner Secrets

by HOWARD EARLE

A technique combining x-rays and ordinary photos is aiding cosmetic and dental surgery, anatomy teaching, and industrial designing.

DID YOU EVER see a photograph of a phantom? It is possible today to make such a picture. But don't become alarmed. These phantoms are not weird fantasies. They are the product of an ingenius combination of photography and radiography.

The technique enables the photographer to penetrate the surface of a subject and photograph the interior. For instance, it is possible to develop within 10 seconds a picture of a woman's purse, plainly showing all the objects in it. Phantom photos also will show the surface of the body and the bone structure underneath.

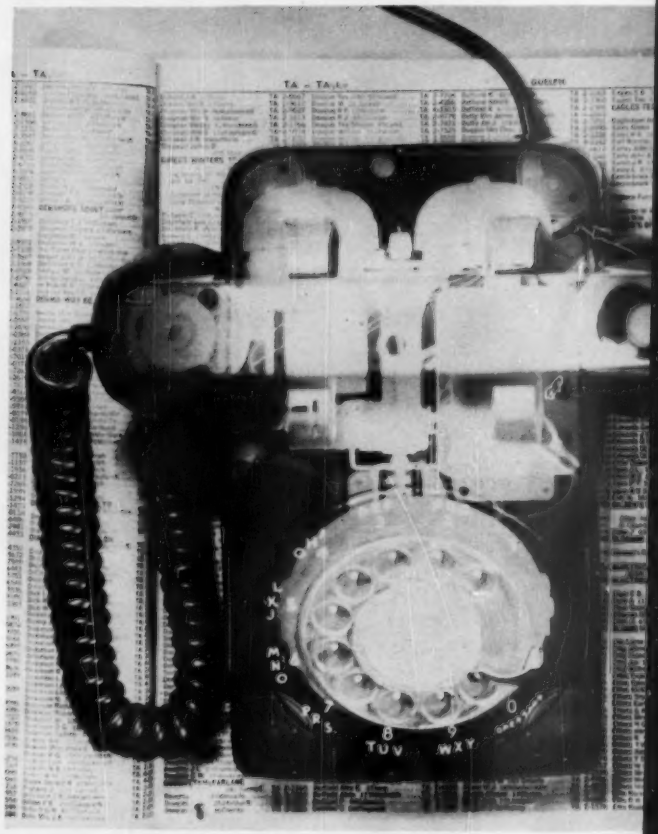
This method of x-ray picture taking was developed by Douglas C. Eaglesham, M.D., of Guelph, Ontario.

"When Roentgen's epoch-making discovery of x-ray was announced in 1895," recalls Doctor Eaglesham, "there was a shock wave of reaction from modest females who imagined their well-clothed figures would become revealed to anyone carrying an x-ray machine. Their fears were unfounded, for radiology became solely a laboratory procedure."

Doctor Eaglesham, head of the Radiology Department at Guelph General Hospital, hopes his method of combining photography and x-rays will be confined strictly to medical and commercial uses.

The technique of combining photography and radiography was not achieved by Doctor Eaglesham in what one might call one masterful stroke. There was much studying, sweating, and perhaps some mild under-the-breath self-reproach before successful pictures were developed.

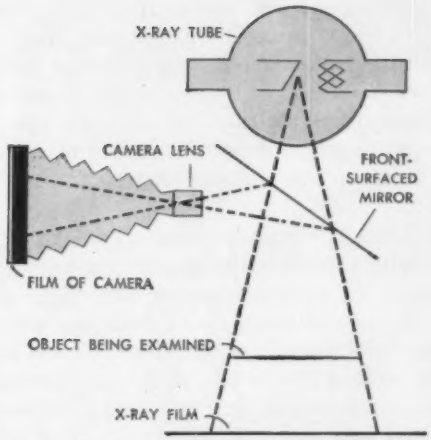
"A photograph shows the surface details of opaque objects," explains Doctor Eaglesham. "A radiograph reveals structure hidden from the eye. I set out to combine the two when I was a student taking postgraduate work in radiology."



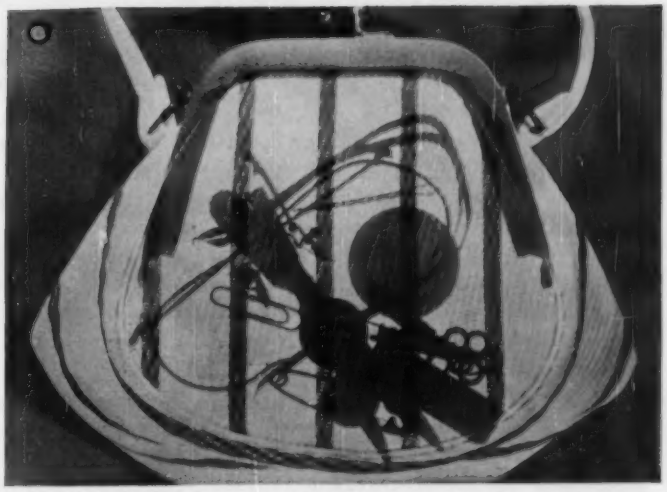
Composite photoradiograph shows relation of internal structures of a telephone to their external surfaces.

The doctor's first attempts to develop what he terms "composite photoradiography" were made in 1938. He recognized exceptional possibilities but achieved little success because simultaneous x-rays and photographs could not be made with any degree of accuracy. The big stumbling block was the inability to obtain identical perspective in the two forms of the subject's image—photography and radiography. But Doctor Eaglesham, a persistent, heavily-mustached, stockily-built individual, turned to another approach.

He studied optical principles. His research led him to devise an attachment to a conventional x-ray diagnostic machine that would take x-ray and photographic views simultaneously in black and white, or color. The result was a composite photoradiograph, the combining of a photograph and radiograph printed by superimposition on photographic paper or film. The finished picture revealed surface details and internal structures in relation to one another.



Dr. Eaglesham's apparatus. Though mirror is in x-rays' path, beam can pass through it easily.



Composite picture shows contents of woman's handbag—keys, paper clip, eyeglasses, etc. Note clarity of both surface and interior.

This print shows the bone structure as well as the flesh of a pair of hands. Note pencil shows through the flesh.

"When I developed my technique," comments Doctor Eaglesham, "composite photoradiography was practically unknown among radiologists and photographers, probably because of a scarcity of information about the subject."

The only references the doctor could find on the subject when be began his experiments were contained in medical literature which described superimposition of radiographs of the skull and photographs of the head to show the relation of facial soft tissues to the jaw bones. These were employed in orthodontic study. No description of special photographic apparatus were given. Neither were any details outlined on the method used, except for the processing technique.

"Two main conditions are necessary," explains Doctor Eaglesham. "The proper apparatus must be constructed and the photographic image must match the radiographic image in size and perspective."

The proper apparatus, as constructed by the doctor, is not complicated. Attached to the x-ray machine are a thick metal plate which holds a camera and a tubular-like housing for insertion of a mirror. The apparatus can be removed when not in use, but it does not interfere with operation of the x-ray equipment.

A front-surfaced mirror is used because an ordinary mirror would cause confusing double images by reflection from both front and back surfaces. The mirror is inserted at a 45° angle to the x-ray beam. It directs the light from the subject into the lens of the camera. Little resistance is offered by the mirror to passage of the x-rays.

The camera lens, in relationship to the mirror, is placed so that it "sees" the object optically as does the the x-ray tube. The camera may be of any size. Lenses with a focal length of two to six inches are satisfactory when working at the usual distance of 36 to 40 inches for medical radiography. However, a camera with ground-glass focusing is preferred, such as in a studio copying camera or a single-lens reflex. Twin-lens reflex cameras are unsuited to this purpose because they may produce a parallax error at short distances.

Illumination is supplied by two lamps on individual gooseneck mounts, supplemented by additional lamps about the room since relatively shadowless lighting is advisable. Electronic flash or flash bulb lighting may be used, but it is not recommended unless the light is reflected from the ceiling. Otherwise, it tends to produce unwanted strong contrasts.

"One bit of caution," warns Doctor Eaglesham. "The camera lens must be of good quality and free from distortion. The same is true of the lens in your enlarger."

The photographic negative and the x-ray negative are developed separately. When dry, they are combined in a darkroom. The two images are printed together on a single sheet of photographic paper or film in such a way that the images appear to be superimposed naturally. It is quite a trick, demanding preciseness and patience, because the photographic negative image must be enlarged to match the x-ray image in size and perspective.

DOCTOR Eaglesham obtained accurate results only after developing his own method for precise registration of images. He accomplished this with lead numbers or small disks of heavy lead foil cut out with a paper punch and placed on the holder, or on the x-ray table around the object under examination. Two or more registration marks recorded on each image will aid immeasurably.

The photographic negative is placed in an enlarger and projected on the easel to form an image matching the radiograph. Since the proper perspective has already been attained in the making of the photographic negative, it is only necessary to enlarge the negative until its registration marks coincide with those of the x-ray negative. The matching can be further simplified by making holes accurately through the radiographic disk images. This may be done with a paper punch.

The x-ray negative is fastened down along one edge by masking tape, which also serves as a hinge to permit enlarging paper to be slid under it. Then the enlarger light is switched on for an exposure which, in passing through the x-ray, records a composite of the two negatives on the enlarging paper.

An alternative method is to first record the x-ray on the paper as a contact print, using a light source other than the enlarger, and follow this by the photographic projection after turning the x-ray back on its hinge.

ANOTHER variation is to make a contact positive transparency. This reverses the tones of the x-ray image and is especially useful when the tonal qualities of the subject being examined are predominantly dark. It has been found, however, that light-toned objects generally are more suitable than dark ones.

Doctor Eaglesham found in a recent modification of the process that the two images may be combined in the camera by copying the developed x-ray image as a second exposure on the original photographic image. The subject material is placed in front of an x-ray viewing illuminator box, on the surface of which is the x-ray film in its light-proof holder. After the photographic and x-ray exposures have been made, the x-ray film is developed and returned to the same position and, with the viewing box turned on,

Photo superimposed on x-ray aids dental surgery. Shown are bony structures, teeth, nasal sinuses, soft tissues.

the x-ray image then is copied as a second, or double, exposure on the original photographic film. This makes a composite negative from which prints are made by contact or enlargement.

Numerous other variations may be used in the processing room. Much depends upon the purpose for which the composite photoradiography is to be employed. The instructor lecturing a group of medical students on the structure of the human body may require a differently processed picture than electrical engineers studying internal workings of a complicated motor. And a print to aid in corrective dental surgery may differ from a print developed to disclose the nature of tissue injury in the human body.

Stereoscopic and color prints and transparencies can be made. If an object is tiny, the composite print may be copied and enlarged to a suitable size, or an enlargement made of the original radiograph with a projection of the corresponding photograph to match it.

Actually, composite photography may be employed wherever it is desirable to demonstrate the relation of internal structures of objects to their external surfaces. END

EDITOR'S NOTE: Further information on composite photoradiography may be obtained from Douglas C. Eaglesham, M.D., Guelph General Hospital, Guelph, Ontario.

by ROBERT M. HENDRICKSON

Why an International Language?

Non solmente in le scientia, sed in omnes partes de nos mundo molestate de crises international, le problema de communication inter populos es importante hodie como nunquam ante.

HUNDREDS OF MILLIONS of persons scattered around the world would find the words appearing at the head of this article intelligible at first sight. The language used is called Interlingua. You may never have seen Interlingua before; you may never even have heard of it. But if you are familiar with French, Italian, Spanish, Portuguese, or Latin you should have little trouble in understanding the message above. In English it reads: "Not only in science, but throughout our troubled world of international crises, the problem of communication between peoples is important today as never before."

Interlingua is not the national language of any country, nor are you likely to hear it spoken. Variously called an international, universal, or auxiliary language, Interlingua has come into prominence in the last decade. Today 20 scientific publications, including the *Journal of the American Medical Association,* are using Interlingua as a second language for publishing abstracts of articles. A physics journal, *Spectroscopia Molecular,* appears entirely in Interlingua. Ten international medical congresses have adopted Interlingua as an auxiliary language in which summaries of papers were published.

Why have these scientists felt the need for yet another language when there already exist an estimated 2796 separate languages, not including dialects? Frederic T. Jung, M.D., department editor of the *Journal of the American Medical Association* (known to its staff as JAMA) explains: "JAMA has a worldwide circulation to 106 nations. Because of its ready intelligibility, Interlingua makes JAMA's material instantly available to physicians abroad who do not know English but have studied Latin or speak one of the Romance languages (French, Spanish, Portuguese, and Italian). If we did not use Interlingua, we would have to provide translations of our abstracts in a minimum of three languages—French, German, and Spanish—to reach an audience of equivalent size. Interlingua makes it possible to broaden our range of communication with only one translation."

HOW WELL CAN YOU READ INTERLINGUA?

Translations on page 88

"Il ha plure disavantages de esser le sol medico in le burgo."

Under the leadership of its new editor, John H. Talbott, M.D., JAMA inaugurated its Interlingua section in February 1960. An editorial accompanying the innovation made some pertinent observations on the problem of choosing a language for international use:

To play an international role in medical writing, a language should have the widest possible diffusion among physicians of the various nationalities. Among the already existing national languages English is far in the lead in this respect. English is the native tongue of over 250 million people and is studied by many others. But a recent UNESCO survey indicates that only half of the world's scientists are at present able to read English. The problem then is to find a language with the widest possible range of immediate comprehension. Medical texts in Interlingua have an estimated range of comprehension that is almost twice that of English texts and can be understood in almost all parts of the world where the Latin alphabet is used.

INTERLINGUA is one of the latest attempts to solve a problem that has vexed travelers, statesmen, businessmen, and language scholars since the 17th century: How can the peoples of the world communicate effectively on matters of mutual concern when their respective languages are mutually incomprehensible?

Of the various approaches to this problem, translation into the native language of the person addressed has been the most often used solution.

When well done, translation into an already existing language is unquestionably effective. But a great deal of time is consumed in the process and the result can only be understood by a small part of the world's people.

When poorly done, translation into a national tongue can lead to results that are ludicrous or ineffective or both. Witness the following excerpt from an "English" translation provided by the editors of a leading French medical journal:

"Authors evoke the various problems raised by intestinal dysmicrobism.

"They make a review of the difficulties encoutered (*sic*) with the use of a truly active lactic therapy because of the frequency of the post-antibiotic accidents.

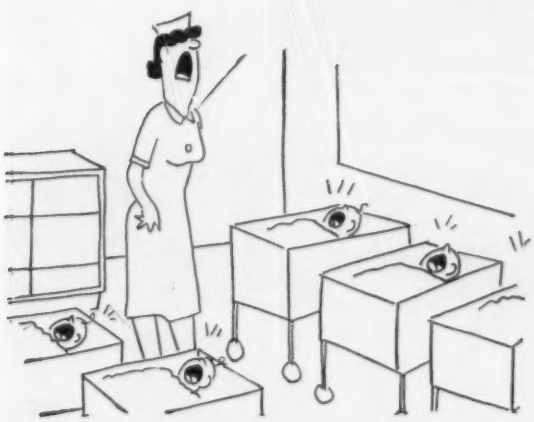
"Such preparations have effectively to perform the implantation of living germs in full growth phase in association with a rehydrating medium that has to be very approaching of the normal biological conditions necessitated by a culture."

Or take the case of the American tourist in Paris who attended an American-made cowboy movie that had been supplied with French sub-titles for the enlightenment of the Parisian audience. When one cowboy greeted another with the classic American phrase, "Howdy, podner," the French rendering came out, *"Enchanté, Monsieur!"*

Another attack on language barriers has been the attempt to promote a single existing national language as an auxiliary tongue to be learned by all people and used as a means of international communication. The language selected would become a truly universal language.

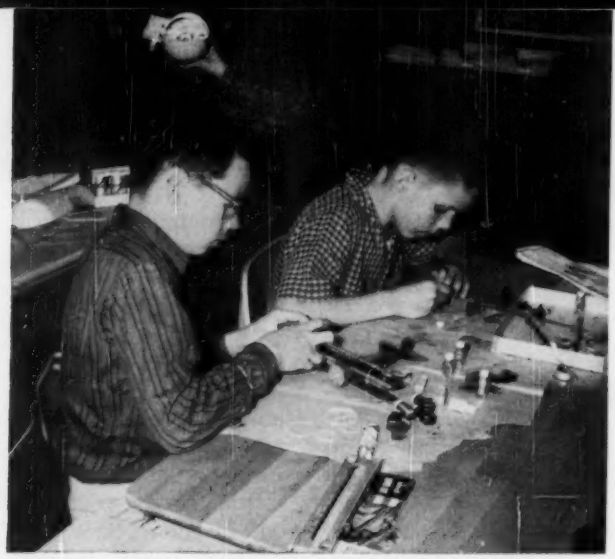
At several points in history, universal languages have in fact ex- (*Continued on page 86*)

CARTOONS FROM JAMA



"Nunc, qui ha initiate iste clamor?"

"Vos osa prescriber me pilulas del mesme color que celles de Helena Smith!"



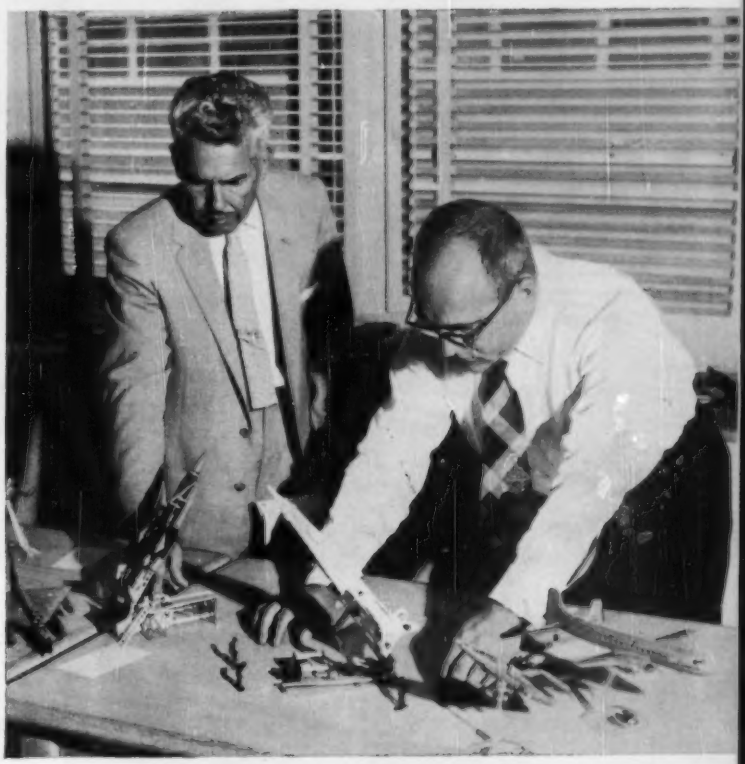
Most of the time students not only enjoy this new form of learning science, they get a big kick out of working with model kits. These boys are likely to understand the basic principles of aerodynamics by the time they have completed constructing this simple model.

Plastic models are used extensively as individual and group projects in an aviation course, one of the most popular in the curriculum, at Stephens, a girls' college and finishing school in Missouri.

After spending about 10 hours assembling this fully-detailed prop-jet engine, this student can discuss every element of the power plant.

These junior high school students, whip-flying a plane they built, are eagerly learning the theory for computing speed. By multiplying the diameter of their circle (20 feet) by pi (3.1416), they got the circumference—62.83 feet. By counting the laps the plane completes in one minute and then multiplying this number by 62.83, they learned the number of feet traveled per minute. Multiplying this number by 60 gives them the number of feet the plane would travel in an hour. Dividing this by 5280 (feet per mile), they have the speed of the plane in miles per hour.

Scale models are used the world over. The Russian boy, left, accepts with pleasure the kits being presented to him by sons of an attache at the American Embassy in Moscow.



After completing models, students are encouraged to display them. They are checked by teachers and any that are not constructed well or according to the instructions accompaniying each kit are returned to the student for more work.

MODEL KITS: A Boon to Education

by EDWARD W. BEAUBIER
Supervising Principal, Unified School District, Paramount, California.

HAVE THE youngsters of America, quite unknowingly, developed a new learning technique? Will one of their major hobbies become a factor in classroom instruction?

There is hardly a boy or girl (or for that matter, their parents) not familiar with the minutely detailed scale model kits which have become part of the way of life for most of the nation's imaginative youngsters.

A survey by National Family Opinion indicates that 90 percent of boys between the ages of eight to 15 assemble models as their prime hobby. And it is this hobby that is inspiring what can be euphemistically termed a space-science age approach to "model" education.

Educators are discovering that for nearly 10 years millions of youngsters have literally been saving their pennies to buy their own textbooks—for these model kits of airplanes, space vehicles, airplane engines, power plants, automobiles, and ships uniquely seem to fit this category.

In each of the packages a comprehensive instruction sheet relates the history of the full-size prototype, often in technical language which many textbook writers would not use for fear it would be beyond the reader's comprehension. It is extraordinary, though, how readily the young model builder makes these technical words part of his thinking and language.

In the opinion of many teachers, students whose hobby has been model building were generally better

High school students in Sitka, Alaska, capsuled their physics program by assembling an atomic power plant kit.

Teachers learn from plastic models by putting them together. Here a group inspects models built by their colleagues.

These life-size plastic female models, built by the American Medical Association, show the organs, skeleton, blood system, and nervous system—a graphic look inside the human body. A taped message describes the function of each organ and system which is illuminated as it is discussed.

motivated toward learning, assimilated knowledge faster, and retained it longer than if exposed to the identical subject matter through usual teaching methods. Invariably, too, model builders achieved higher grades than the non-model builder.

Model kits have even given birth to scholastic humor. An Associated Press dispatch told of a B-47 jet plane thundering over a school in Wichita, Kansas—while the first-graders were playing during recess. "Hey," said one little boy, "would you check the dihedral on that wing!" "Yeah," said a playmate. "I'll bet you didn't know that thing touches down at 135 miles per hour!" The first lad countered, "Sure did, but I'll bet you don't know those J-57 engines generate 5800 pounds of thrust!" The school bell rang. "Hey, we got to go in," said the child. "It's time to get back to stringing beads!"

Hundreds of educators found an opportunity to study the use of model kits in the more than 80 annual Education Workshops conducted under sponsorship of the Educational Division, Civil Air Patrol, the United States Air Force, and various colleges and universities in practically every state.

Typical of the comments at the conclusion of one of the six-week courses was that of one fifth-grade teacher, a grandmother, who had never built a model before, having always been satisfied with admiring those her pupils brought to school. "Now, however, I am busily at work assembling an S-55 helicopter; and yesterday I bought a Bomarc and Snark. It's much more fun, and I learned more that will be of use in my teaching than knitting and jigsaw puzzles, my two other hobbies."

THE BIG RACE!!
Oxnard, Calif. to Boston, Mass.
Distance – 2800 miles (approx.)
Speed of automobile – 65 M.P.H.
Speed of P-39 – 400 M.P.H.
Speed of F-104 822 M.P.H.

These youngsters are a computer group determining the number of hours required for each of the real life counterparts of their models to make a coast-to-coast trip.

This youngster has completed a heart kit. The model features come-apart sections so that interior chambers may be studied.

Today "model teaching" is being explored in a number of educational institutions. Los Angeles State College has set up a special class for graduate teachers for the study and analysis of these products as three-dimensional textbooks. The Paramount Unified School District is researching this method in a number of classes in elementary and junior high school levels. Similar programs are under way in other school systems of the nation.

Business organizations are assisting in this exploration. One of the world's largest producers of scale model plastic kits recently formed an educational division to prepare teacher's handbooks and to service the deluge of information requests as to the best use of model kits in the classroom. Under the guidance of nationally-known educators, a "Model Building and Instructional Guide" was developed. Digesting thousands of hours of classroom experience, it covers such varied subjects as vocabulary building, mathematics, social studies, history, physics, spelling, and reading.

The United States government, recognizing the worth of model kits as teaching tools, has appropriated funds under the National Defense Education Act for their purchase, to be used in the study of physics and science at junior high, high school, and college levels.

Teaching "success stories" with model kits are many. Fifth, sixth, and seventh graders in a Manhattan public school are aided in learning their American history by constructing plastic kits.

One New York City teacher considers model kits a boon to student and teacher alike. When studying the War of 1812 her students built a model of *Old Ironsides*. This gave them an insight into the shipbuilding materials of that day, the construction methods that were used, and knowledge of the growing maritime trade of the newborn nation.

A principal reports the effectiveness of model kits in teaching Johnny to read. "The transition from working with model kits toward improvement in reading has been considerable," he wrote. "From the point of view of encouraging children, these construction activities have no equal."

This principal requires his pupils to inventory the various parts and learn their names and shape by actual handling. Using a dictionary as a supplement, the class then writes fuller definitions of the parts on the inventory sheet. The class then reads the material on the instruction sheet, recording and discussing unfamiliar words.

The model is then constructed, with each part checked against its word description. After completing the model, the students discuss it, including their understanding of the directions that had to be followed. This process gives students individual and group satisfaction and also stimulates many of them to do extracurricular reading about the ship, plane, or car.

"The very act of assembling a model kit," says a dean in an Oregon high school, "brings the tactile senses into the learning process. It's a rare builder who will not be generated to continue research into the history of the miniature he has built in class."

The dean believes the model kit has been of great assistance in the teaching (*Continued on page 72*)

His Goal: To Better Serve Mankind

(*Continued from page 32*)

Most likely he'll be part of a team consisting of an intern, a resident, staff physicians of the faculty, and himself. Under competent guidance, Jerry will learn how to take a patient's history. He'll give patients physical examinations, outline diagnostic impressions, and perform laboratory work. He may be assigned two or three different patients and he'll follow their progress during their hospital stay.

Generally, his cases will involve internal medicine, pediatrics, psychiatry, obstetrics, gynecology, and surgery. He may even "work" in the outpatient clinic. Most likely he'll broaden his knowledge in such special fields as ophthalmology, otolaryngology, urology, orthopedic surgery, and other medical areas. And all the time he'll continue his studies in the basic medical sciences. He may also take elective courses and participate in a variety of research projects.

As a hobby, Jerry reads Greek and Russian literature. For Christmas he bought himself a present: a set of Greek classics including Aeschylus, Sophocles, and Euripides. He was introduced to the classics in one of his undergraduate courses and enjoyed the experience. "The stories themselves are quite entertaining," he says. "In fact, they are almost exercises in thinking and how to figure out problems."

Jerry, like so many other premedical students, is looking into the future with great confidence. He knows that in a few years he's going to be a physician. He's not quite sure what kind of physician he'll be—whether he'll be a family doctor or a physician dedicated to research. He may consider space medicine, public health, the foreign service, or even the military forces. Medical problems in industry, schools, and administration may capture his attention. Or he may decide to be a teacher of other medical students.

But he's sure of this: As a physician he'll have the ability to relieve suffering, to make people happier, to save lives, and to lengthen the lives of his patients. He'll be possessed with the knowledge, skills, and tools to help create healthier and happier lives for all people.

As a physician, he'll be stimulated with the fact that he is adding important clinical information to the vast fund of medical knowledge. He knows he'll enjoy a comfortable living, and that he'll hold a position of trust and respect.

As a physician, he'll represent help and hope in his community, and he asks, "How else can I better serve mankind?" END

Visit America's "Lost" Country

(*Continued from page 44*)

Canyon. In it live the People of the Blue Green Water—the Havasupais—our smallest and most remote tribe of Indians.

Because of its rare beauty, the canyon home of these Indians is often referred to as a Garden of Eden, a Utopia, a Shangri-La. All of these descriptions fit it well. Locked away from the outside world by towering brilliant red walls, it is scarcely three-quarters of a mile at its widest point and only eight miles long.

Winding through this striking corridor and contrasting strongly with its color, is turquoise-blue Havasu Creek, lifeblood of the canyon. (It is from the Creek that the Indians get their name: hava-water; vasu-blue; pai-people.) Lacy green willows and stately cottonwoods arch the stream's path. There are three lovely misty waterfalls, one higher than famed Niagara. In this semi-tropical oasis, almost every variety of cacti is found and fragrant fig and peach trees grow abundantly. Around the canyon's only village, Supai, are clustered the queer huts, varying in size and description, of the happy-go-lucky Indians.

This hidden wonderland is but 65 miles west of Grand Canyon Village and is within the boundaries of Grand Canyon National Park. But whereas the scenic wonders of Grand Canyon are viewed each year by hundreds of thousands of tourists, Havasu is seen by a comparative few.

There is no simple way to get to Havasu, although anyone who is physically able can safely make the trip. It is reached only by precipitous horse and foot trails, but they are wide, well-established, and not to be feared. And the reward is great: The journey is thrilling and adventurous, the scenery sensational, the Indians intriguing.

The difficulty of access is one of the reasons why Supailand has retained its idyllic charm. Even to get to Hualpai Hilltop, the starting point of the main foot and horse trail, you must turn north off U.S. Highway 66 five miles east of Peach Springs, Arizona, and drive 62 miles through the Hualpai Indian reservation over a gravel road. (Have your gas tank full; there are no facilities along this road. To prepare for emergencies, you should have along an axe, tow rope, and chains.)

The road ends on Hualpai Hilltop, which we call the "jumping off place." Park your car, lock it, and take a look. Here, 1600 feet below you, on the canyon floor, you can see a white line—the trail you are to take—meandering across a flat of gray polka dots, which you will soon identify as sagebrush clumps. Your stomach may flip a bit when you note that the trial also zigzags up the precipice on which you stand, but when you start down, you will find that it is six feet wide.

In the distance, the trail disappears between the high buff and lavender walls of Hualpai Canyon, the six-mile gateway through which you will pass to the portals of Havasu. It is two miles farther to Supai.

The only building on Hualpai Hilltop is a weather-beaten shack housing a telephone on which you can ring Supai for horses. Indians will bring them up (allow plenty of time) and you can ride the trail to Supai. Cost will be about $14 per horse, round trip. These sure-footed horses are rented by Havasu Enterprises, a community venture important to the economy of the Havasupais. However, if the Indians know you are coming they will have the horses at the hilltop waiting for you. For such arrangements, write or call Tourist Manager, Havasu Enterprises, Supai, Arizona.

The Indians will charge you $1 for each camera you take with you, but this is a bargain because there are many opportunities to shoot unusual and scenic pictures. Since you will be wanting to stop and photograph

often, it is wise to allow a full day for your trip into the canyon.

In Supai, tourist accommodations consist of two small lodges (with modern bathroom in each) operated by the Indians. If you wish to camp and have lots of gear, order an extra pack horse and sleep under the stars. (There is a general store in Supai where you can buy canned goods but no fresh meat.) The campground on which you are required to camp is about three miles beyond Supai.

Some visitors to the canyon prefer to hike, carrying light camping equipment on their backs. Hikers are charged 50 cents and are asked to notify headquarters in Supai before leaving Hualpai Hilltop. If you hike, be sure to start early in the morning, carry a lunch and a canteen of water, and wear sturdy hiking shoes. You'll find the path dusty and rocky but extremely scenic. There is no danger of getting lost, for Hualpai Canyon is a narrow red cleft and once in it you can go no other way. The telephone line which rambles haphazardly along the walls is reassuring.

It's best to go into the canyon in fall or spring—the summer is much too hot. Midsummer temperatures have been known to reach a blistering 117°. Your cost will depend on whether you go horseback or hike. If you wish, there is available a five-day commercial guided tour.

Once in Havasu, you will be amazed that such a land exists. You will find the fun-loving, Mongolian-featured Indians one of the prime attractions. When we first traipsed down the dusty single street of Supai and entered the white sub-agent's office to register, we found it lined with curious Indians who had gathered there to see what manner of people had come in. We were curious too.

We noted that the men wore blue jeans and black felt hats, their dark hair cut short. The women had straight heavy black hair with bangs to the eyebrows and their round faces beamed cheerfully above non-descript ill-fitting print dresses. Many of these people, particularly the elderly, conversed only in their native Yuman tongue. Many never had been "over the wall"—outside Supailand.

It was soon evident that civilization had only lightly touched this canyon. There was no newspaper, no TV, no sidewalks or paving, no auto-

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mobiles or vehicles of any kind. There was no hurried frantic pace. Instead we found these people living a relaxed, happy life under semi-primitive conditions and clinging to many of the customs of their ancestors.

Although they are ruled by a Tribal Council, they still have a Medicine Man. And their most important ritual is a sweat bath, which strongly resembles a Finnish sauna. Almost every Indian home has somewhere near it one of the cave-like tiny rock bathhouses. On "ritual days" (which are also social) heated rocks are placed in the cavern. Four men clad only in breech cloths enter and dash cold water on the rocks. Enveloped in the hot steam clouds thus created, they chant the songs of their forefathers. When they feel they are cleansed, both physically and spiritually, they dash for a swim in Havasu Creek.

The Indians may resent your watching this ritual and you should take care to respect their wishes and in no event should you be guilty of invading their privacy. For actually you are but a visitor on their reservation.

In the freshness of spring, the jingle of the canyon's single tractor is heard plowing the fields, for the Havasupais are agricultural Indians. Each has been assigned a patch of land by the Tribal Council and on it he raises corn, melons, alfalfa. Land is carefully, although crudely, irrigated with water from Havasu Creek. In the fall, crops are harvested and sometimes a noisy festival held.

Interesting are the sod, grass-roofed hogans, looking like something one would expect to find in Africa, in which grain is stored for the winter months. Some Indians still prefer to use caves in the canyon walls, built centuries ago by their ancestors as fortresses against enemies. It is believed these Indians were driven into the canyon by the warring Apaches. Evidence of this is a path called "Apache Trail" which tiptoes along the rim high above the canyon.

The little village, like everything else in Supailand, is built within the shadows of the vermilion walls. Along its main street is the subagent's home, the post office, the general store. Turn the corner and you pass by the little white four-grade school and Helicopter Church, so named because it was flown in piece-by-piece by helicopter. Ordinarily, there are only four white people in Supai: the Episcopalian missionary in charge of the church, who doubles as preacher and doctor; the subagent and his wife; and the government school teacher.

The Supai post office has the distinction of being the last in the U.S. to be serviced by pack train and postmarks from here are considered collectors' items.

The most exciting event in the village is the semiweekly coming of the mail. About the time the pack train is expected, three of four Indians continually ride horses from the flag-flying postoffice to the edge of town and back, each seeking to be the first to sight or hear the pack train. When this does happen, they race their horses through the village in the manner of Paul Revere, shouting "The mail she come! The mail she come!"

Then the villagers swarm to the post office to get their mail, which consists mainly of brightly-colored mail-order catalogues and old-age pension checks.

You will find the young Indians in Supai friendly and ready to assist you in any way. Older Indians will be more reserved. Contact the subagent for anything you might need.

But don't plan to spend all your time in the village; surrounding you are a wealth of hiking opportunities, both strenuous and easy. Choose the ones which suit you best. You will not want to miss Mooney Falls, a graceful cataract some 65 feet higher than Niagara. From an overlook a thousand feet above the falls, you can get a stupendous view of the cascading torrent. You can see deep indentations on the walls where early day miners attempted to pick out some of the silver which is found throughout the canyon. But the difficulty and expense of getting the ore out of the canyon defeated them.

You will pass Havasu Falls on your way to camp, but you will want to re-visit it again and again. It is

PHOTO: THE RAYCO COMPANY

SEAT BELT MAKER TAKES TIP FROM AIRLINES

SAFETY AUTHORITIES have deplored the fact that even after automobile seat belts are installed, many riders fail to use these devices every time they are a driver or passenger. Now at least one belt manufacturer has taken a tip from the airlines and places a constant reminder sign in cars when belts are installed.

Use of auto safety belts would have saved upwards of 5000 lives last year, says the National Safety Council, pointing out that riders are as much as 60 percent safer when held in place by seat belts.

a sparkling twin waterfall and we think it the most beautiful of all. It tumbles some 90 feet into a huge pool in which the Indians swim.

Navajo Falls is nearest Supai and, while not as pretentious as the others, is still a pretty 50-foot cataract with a lot of thunder.

For the rugged, there is an arduous day's trip to the confluence of Havasu Creek with the wild Colorado River.

Some of the hiking paths lead up the walls and are easy even for the amateur. We found these climbs surprising experiences. For once you reach the top of Havasu's red walls, you look upward to other walls, still higher, which shade from lavender to buff to white and mauve and look more like the Grand Canyon.

You will discover many interesting trails yourself. There is one which leads to the little Indian cemetery where the Indians bury their dead—and another trail, which they avoid, to Crematory Gulch where their forefathers were cremated in accord with ancient rites. From Apache Trail, we felt we had our best over-all view of Supai. Throughout the canyon, there are weird rock formations. An exceptional one startingly resembles the ancient Grecian Parthenon; it can be seen from Apache Trail.

Practically no wildlife, such as deer, bear, or coyote, is left in the canyon. There are no fish in the milky waters of Havasu Creek. But you will see birds galore, including the tiny canyon wren, bluebirds, finches. As yet, English sparrows have not found the Canyon.

The government, because of the difficulty in caring for these Indians, would like for them to move to the "outside." But the Indians steadfastly refuse to leave their canyon home. Some say this is due partly to their superstition concerning two cathedral-like balanced rock formations, the "Wigleeva" which one must pass on the way in and out of the canyon. The story goes that the Indians believe these are a God and Goddess who watch over them and that as long as these rocks stand, it is the destiny of the Havasupais to remain in the canyon.

We hope the so-called God and Goddess remain at the portals of Havasu for years to come, for we feel they bid visitors welcome to one of the most unusual little canyons on earth. END

Carbon Monoxide: The Unseen Killer

(*Continued from page 27*)

in cars with the engines running."

Although most carbon monoxide deaths happen behind the closed doors of a garage or because of defective exhaust systems, every year people are asphyxiated on the streets in autos that are in perfect condition. A Washington, D. C., commuter, for example, stopped his new car in front of the house of a member of his car pool. He honked for the man to come out and settled back to listen to the car radio. Ahead of him a taxi, its motor purring, waited for a passenger.

When the other member of the car pool finally came out, he found his friend dead. His heater fan had sucked the exhaust of the cab into his car and in just a few minutes the carbon monoxide had reached a level sufficient to kill him.

Nothing ruins a man's memory for faces like a plunging neckline. **—F. G. Kernan**

How does this gas kill so quickly? Medical science owes its first insights into carbon monoxide gas to the great English chemist, Humphry Davy. At the Medical Pneumatic Institution in Bristol in 1799, Davy, then only 21 years old, breathed from a silk bag a mixture of air and a hydrocarbonate which contained about 40 percent carbon monoxide. He felt his own pulse and recorded his body temperature with a large bent thermometer held under his arm. After a minute of the gas, Davy wrote, "It produced a slight giddiness and pain in the head, and a momentary loss of voluntary power: my pulse was rendered much quicker and feebler." Dizziness, palpitation, and blurring of vision next overtook the young researcher. Then he breathed hydrocarbonate unmixed with air.

"I made three inspirations and expirations of the hydrocarbonate," he reported. "The first inspiration produced a sort of numbness and loss of feeling in the chest and about the pectoral muscles. After the second inspiration, I lost all power of perceiving external things and had no distinct sensation except of a terrible oppression on the chest. During the third expiration, this feeling disappeared. I seemed sinking into annihilation and had just power enough to drop the mouth-piece from my unclosed lips."

After a short interval in which he breathed clean air, Davy revived enough to put his fingers on his wrist.

"I found my pulse thread-like and beating with excessive quickness," he noted.

Later researchers set down the symptoms caused by carbon monoxide poisoning with more accuracy, but there would be no difficulty in recognizing it from Davy's description. Since Davy's time the composition of this deadly gas has been revealed. It is known to be the result of incomplete combustion. The pretty blue flame in a campfire or in a well-ventilated fireplace is burning carbon monoxide. When a fire is starved for oxygen, the carbon monoxide does not burn. It is discharged into the air. That is why poorly-adjusted space heaters can turn a motel room or hunting cabin into a death chamber.

Carbon monoxide is always present in the exhaust from an internal combustion engine. It ranges from five to 15 percent, depending upon the carburetor adjustment. The richer the mixture in your engine, the more carbon monoxide pours out of your tailpipe.

Humphry Davy also did not learn how the gas kills. We know now that it has a remarkable affinity for red blood cells. It is absorbed by them 250 times as fast as oxygen. The gas unites with the hemoglobin and keeps it from carrying oxygen to the tissues. This means that even a seemingly inconsequential .02 percent carbon monoxide can be lethal.

The first symptoms are stealthy. There may be a tightness about your forehead, a headache, and some dizziness. You feel tired. If you are driving a car at night, the lights of oncoming traffic may seem particularly dazzling and the darkness that follows particularly dark. Your eyes may blur. Then there may be nausea, vomiting, and a fluttering and throbbing of the heart. Unconsciousness follows and then, death. Even if you are rescued at the last minute, chances are that irreparable damage will have been done to your brain and nervous system which are sus-

*DEAR GRANDMA... As all "pet relatives" know, little folks' scribbles are the most treasured of love letters. Too, from these very scribbles, a child can learn the fun and magic of letter writing.

Child psychologists tell today's mothers practically everything in childhood has an adult carry-over, even these scrawls of children thinking they are writing.

By helping child establish patterns of fun and delight in this early "writing" stage—letter writing (especially a thank you letter) can be lots of fun for a child to do.

It's suggested that when you're writing grandma or somebody else close to the family, you give your small crayon-pusher a piece of paper to "write", too.

Have child tell you what those scrawls say, jotting this down on child's "letter". This gives clue for a reply as letters prompt an answer. To receive a note or a letter is very exciting for a child.

Today's orally expressive youngsters readily learn the endearing quality of "please" and "thank you". And, this quality belongs to thank you notes.

When old enough to talk, child enjoys dictating letters. Put down child's exact outpourings. Later when the child can print and later actually write, writing a letter on his own is a joy and an achievement. And, no matter how jiggly, how misspelled, or smudged—let it go. The creative effort is what is important.

The letter is what is enjoyed by both the sender and the recipient. Besides, there's time enough for grammar and spelling and punctilious English and all that when child gets through the primary grades.

Tastes so good—costs so little

Many times during a day, as you work about your home, the lively taste of Wrigley's Spearmint Gum can give you a refreshing little lift. It's a healthful, satisfying treat. And, chewing aids digestion.

ceptible to injury by oxygen starvation.

Some people believe they are naturally immune to carbon monoxide poisoning. The blunt truth is that all human beings can die of the gas. Some, however, can withstand the effects of it better than others. This is because their spleens and bone marrow are more productive. When carbon monoxide begins to pollute the blood stream, the spleen discharges armies of red blood cells to keep oxygen flowing from the lungs to the tissues. The bone marrow increases the production of red blood cells. A life and death race commences between the organs supplying new red blood cells, and the carbon monoxide which is seizing them. But all the most vigorous body can hope to accomplish is to prolong the unequal struggle.

There are other reasons why two people may sit in an auto filled with gas and one die and the other survive. If a person is active, he burns up his supply of oxygen faster and dies sooner. This is why small, active children are the first to succumb to the creeping killer. It is also true that people with poor circulation, anemia, or heart trouble are more vulnerable to the gas.

Carbon monoxide poisoning from motor exhaust sometimes finds Trojan horse allies to overpower its victims. The American Medical Association's Committee on Medical Aspects of Auto Injuries and Deaths points out that tobacco smoking also increases the level of carbon monoxide in the blood. High altitudes force the lungs to work harder to supply the body with oxygen. Therefore if you smoke while driving your car along mountain roads, you will suffer from the effects of carbon monoxide leaked from your engine more rapidly than otherwise.

What most concerns accident prevention experts is the level of carbon monoxide poisoning that may be encountered by a motorist, smoking a cigarette, driving a lonely road at night. He may feel sleepy. He yawns, and finds it hard to keep his mind on his driving. In his half-poisoned condition he misses a turn and crashes off the road, or he wanders across the center line and runs head on into a car coming the other direction.

"Carbon monoxide poisoning appears to be the explanation for many

(*Continued on page 71*)

TIPS *for your home and family*

HEALTH RULES FOR COLD WEATHER ... FIREARM PRECAUTIONS ... TEACH BIKE SAFETY

SNOW AND ICE can be a lot of fun for bobsledders, ice skaters, snow man-makers and other cold weather advocates, but for most people winter also means sniffles, sneezes, and colds. Winter calls for renewed attention to these health rules:

- Chills can lower your resistance to infection, so dress warmly and avoid drafts.
- If your shoes get soaked or your socks get wet, take them off as soon as you get home, take a hot footbath, and put on dry socks.
- Don't overburden your heart by excessive snow-shoveling or by too much exercise or physical work.
- Even though it's the season for holidays and family gatherings, don't overeat.
- Sleep is the best energy-restorer—get your share of it.
- See a physician if you have a sore throat, fever, headache, or general aches and pains. Let him make sure that you have a simple cold and not strep throat or other serious ailments.
- If you do have a cold, stay home until you are well. Don't go to the office and give it to your fellow workers.

BIKE SAFETY: Thousands of youngsters from seven to 17 will be using their bicycles for transportation to school, to run errands for mom, to deliver newspapers, and for pleasure riding. Each year approximately 30,000 children are injured in bicycle accidents and 400 are killed.

MOST CHILDREN will trust that automobile drivers will not run them down. Unfortunately, drivers often cannot see the cyclists.

TO REDUCE THE NUMBER of traffic deaths and injuries among children riding bicycles, parents must insist that children know the basic rules of highway safety, and they obey all traffic laws. The parents should also make sure the bicycle is inspected for mechanical safety, and that the bike has adequate lighting for night cycling. Devices that reflect automobile lights at night will help motorists see the youngsters.

CYCLISTS SHOULD KNOW AND FOLLOW THESE RULES:

- All bicycles should be kept in good condition. There should be no faulty brakes, worn out reflectors, or defective handle bars.
- Cyclists should use hand signals when they turn, approach intersections cautiously, never hang on to trucks, buses, or other automotive vehicles, and yield right-of-way to pedestrians. All traffic lights and signs should be obeyed. Riders should also adjust to road, weather, and traffic conditions.

(over)

TIPS for your home and family (continued)

SOME PEOPLE USE THEIR TEETH to open hard-shell nuts at Thanksgiving parties. You may be the life of the party with this trick, chides the American Dental Association, but you won't do your teeth any good. A nutcracker will crack nuts better, the ADA says. Other holiday tips:

- Don't use your teeth to remove string and wrapping paper from gifts—a scissors or a razor is better.
- Brush your teeth as soon as possible after you eat cakes and candies. The sugar in the sweets often sticks to the teeth and helps cause decay.
- Don't bite on your pen when you sign greeting cards—when repeated, this performance can result in considerable wear on the teeth.

GUN-BEARERS BY THE THOUSANDS this fall will take to the woods and dales in pursuit of game birds, rabbits, moose, deer, squirrels, and other targets. Unfortunately, a few hundred humans will be fatal casualties—victims of gunfire. Firearm accidents can be avoided. Here's how:

- Know what you are firing at before you pull the trigger. Don't fire at an unknown "something" moving in the brushes.
- Don't release the safety until just before you shoot, and don't shoot at a flat, hard surface, bottles, or tin cans—ricocheting bullets are dangerous.
- Unload the firearm before you cross a fence or climb a tree—the weapon might fall and discharge.
- Never point a gun at anything you don't intend to shoot, and always carry the weapon so that you control the direction of the muzzle even if you stumble.
- Keep children and irresponsible adults and teen-agers away from guns. Don't leave a weapon unattended without first unloading, and store guns and ammunition in a safe place, preferably under lock and key.
- Don't carry loaded guns in your car. Unload all weapons before you enter your home, cabin, or tent.

NOW THAT YOUR CAR IS WINTERIZED, take a long look at your driving technique.

- Slow down when the weather is bad. The speed you were used to in summer is probably too fast for winter conditions. In approximately one out of four fatal auto accidents last year, the road was wet, snowy, icy, or muddy, reports the National Safety Council.
- Wiper blades, heater, and defroster should be checked and put into good operating condition, and windshields should be kept clear. In fatal auto accidents in which the driver's vision was obstructed, rain, snow, and sleet on the windshield occurred in two out of five instances.

Dennis Orphan

of those head-on collisions where a person steers right into an oncoming car," says Captain Drago.

J. Stannard Baker, director of the Northwestern University Traffic Institute, has long been concerned about carbon monoxide as a contributing factor in highway accidents. In 1937, he was alerted to the problem by the experience of a route salesman for a large tea company in Illinois. It was part of Baker's job at the time to find out why the company's drivers had accidents. The salesman in question was awarded a new route because of his excellent record. Then within 80 days he had four serious accidents with his company car, each involving about $300 damages.

One day the manager called Baker in to find out why the salesman was having so many accidents.

"I'm going to have to let him go if this keeps up," he said.

Baker drove with the salesman and observed that he was a very good driver. Yet the records showed that on four occasions between the hours of four and five in the afternoon he had caused an inexplicable accident. In each case he had either run off the road or rear-ended another vehicle. Realizing how much domestic emotional difficulties can affect a man's driving, Baker checked the salesman's home. He appeared to have a happy home life. He seemed happy with his job too, except for one thing.

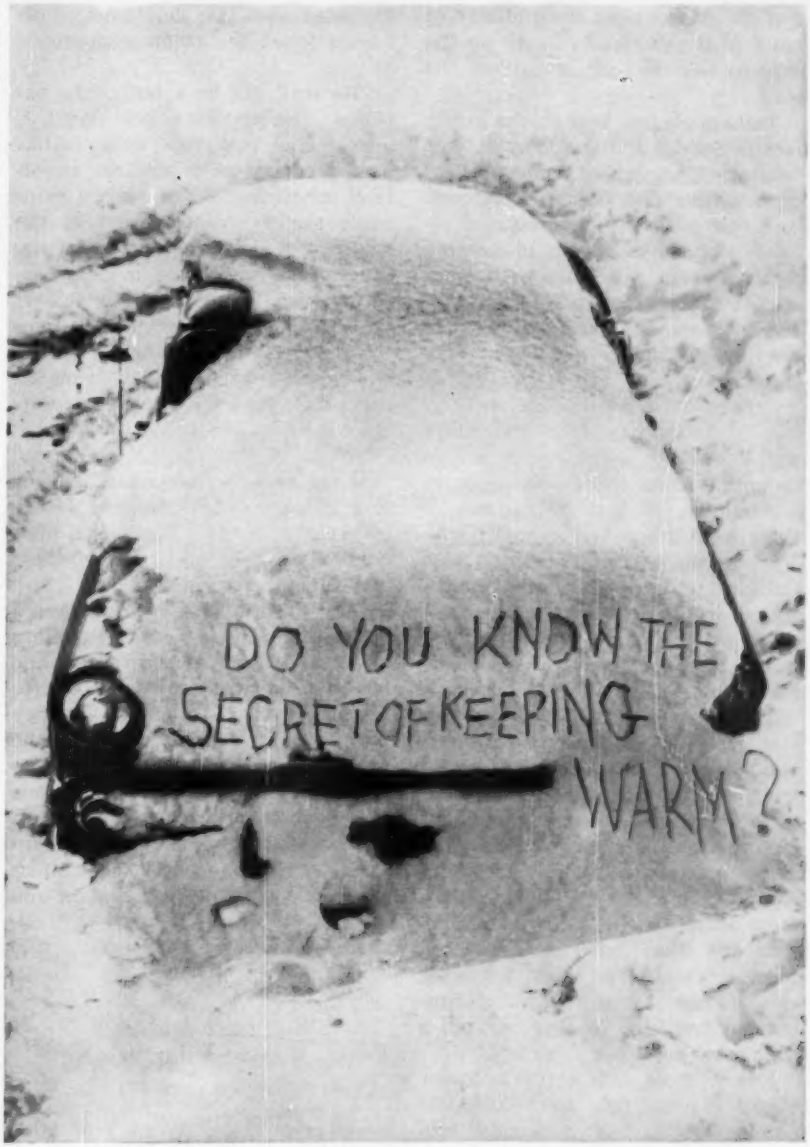
"I smell bad when I come home," he said.

"What do you mean?" asked Baker.

"Sitting around in the car all day, I get to smell like exhaust."

Baker immediately suspected the culprit. He drove to the garage where the salesman's car was being repaired. The exhaust pipe had a gaping hole in it. On chilly days when the salesman drove with the windows closed, his car gradually filled with enough carbon monoxide that by the end of the afternoon he was feeling sluggish at the wheel. The stage was set for his four accidents.

Baker says that most modern cars have good combustion and tight exhaust systems, although they must be kept tuned up and leak-free for safety's sake. Together with most other experts he is, however, highly critical of the location of intakes for car ventilation systems in some



The secret of keeping warm is keeping your body dry. When you perspire, if

the moisture evaporates on your skin, you run the risk of chill. Ask your doctor about this health problem.

New Duofold 2-layer insulated underwear greatly reduces the danger of chill. It does so with the scientific 2-layer construction patented by Duofold. The inner layer, right next to your skin, is 100% pure soft cotton which cannot itch. It absorbs moisture as only cotton can, and passes it on to the outer layer.

Duofold's outer layer of virgin wool—blended with cotton and fortified with nylon—evaporates the moisture away from your skin. The air space in-between these two lightweight layers insulates you like a storm window.

Because it's dry, Duofold warmth is never excessive, even indoors. 7 different fabric warmths—in longs, shorts, matching shirts, and unions—give you just the right warmth for your job, your sport, your climate.

See for yourself why modern Duofold means so much to so many men everywhere. Often recommended for health. Priced higher than bulky underwear—and worth it. At good stores everywhere. Or write to: Duofold, Inc., Box 361, Mohawk, N. Y.

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models. Vents near the radiator in front of the car tend to suck up the exhaust of the car ahead on the road.

Tests made last year by the Public Health Service at the Robert A. Taft Sanitary Engineering Center at Cincinnati bear out Baker's comment. In a test series which simulated vehicles stopped at a railroad crossing to let a train pass, cars with front inlets took in up to six times as much carbon monoxide as did those with cowl inlets (inlets near the windshield).

Other tests made in California by the highway patrol indicate that well-located air vents are critical in keeping carbon monoxide levels at a minimum inside a car. It has always been assumed that open windows in the car meant safety. The California tests showed that sometimes an open window creates a draft which actually helps exhaust fumes seep up through the floorboards.

To counteract this, engineers advise motorists to keep their front vents open. This sends a flow of fresh air through the car and out of the window. Of course, they point out, this is scarcely practical if the vents are placed where they are scooping up not fresh air but fumes from ahead on the road.

In any case, motorists are urged to close their vents when following close to another car in bumper-to-bumper traffic or passing through a tunnel behind other vehicles.

Every year the nation's motor vehicles pour out 169,600,000,000 pounds of carbon monoxide into American cities. The share of each urban dweller amounts to some 30 pounds of the deadly gas every 24 hours. Fortunately, most of it is dispelled by the motion of the cars and by winds. It does not tend to collect in the atmosphere as do other exhaust pollutants.

Nevertheless, many public health authorities have become worried about the possible effects of low-level concentrations of carbon monoxide in tunnels, at cab stands, on expressways, and on canyon-like city streets. They point out that policemen have been tested at the end of a tour of duty directing city traffic and found to have 35 percent of their hemoglobin united with carbon monoxide. W. W. Bauer, M.D., the American Medical Association's director of health education, says that for this reason you should not be offended when the traffic cop growls at you.

"He may not be a bully," he explains. "He may be a sick man."

So far, no conclusive evidence has been produced as to whether street-level concentrations of carbon monoxide are a serious threat to the health of pedestrians and motorists. Studies are now being made to ascertain this danger. At the Robert A. Taft Sanitary Engineering Center, engineers are employing a "gas chamber on wheels" which runs on rollers, to test engines under operating conditions.

"With this chamber," they say, "we are going to see what happens to a Chicago citizen standing on the corner of State and Madison at high noon as he goes about his business breathing the city air."

Mindful that by 1970 an expected 100 million vehicles will be traveling some one trillion miles a year, public health authorities are not inclined to be complacent. But neither are they pushing panic buttons concerning the possible environmental dangers from carbon monoxide let loose in our streets and expressways. They warn instead of the clear and present danger from the unseen killer as a direct cause of death by asphyxiation and an indirect cause of tens of thousands of highway accidents. END

Papa Was a Pilgrim

(*Continued from page 37*)

veyed the table, "Well now, this looks and smells mighty fine, don't you think?"

"Yes, Papa," we agreed. The Pilgrims never had it so good, even with turkey.

Beaming, he began to serve the first plate, then paused. "Mama," he said, "where's the creamed chipped beef?"

"Oh, my goodness." Mama jumped up. "Our meat!"

We laughed and laughed.

And then she came back, carrying the big platter.

"Oh, Papa," we breathed, staring at the great, golden bird.

Mama placed the platter before him, proudly. "You may well say, 'Oh, Papa,'" she said, getting the carving set from the sideboard drawer. "He borrowed the neighbor's gun and went after our turkey."

Papa waved a hand. "Well, he was wounded. It was me or a coyote." He poised the bone-handled knife above the turkey. "Now that we have the horse before the cart, where it belongs . . ."

I had a swift vision of him wading the deep snow in the dark and cold—how far?—holding the lantern before him as he followed the track.

Hazel, the five-year-old, gazed at him gravely. "Papa," she asked, "are you a Pilgrim Father, too?" END

A Boon to Education

(*Continued from page 63*)

of geometry. Heretofore, geometric shapes to the average student were merely either white chalk lines on a blackboard, or black lines in a textbook. But after a student, for instance, breaks down the geometric shapes composing the wings of an airplane and its fuselage, it is likely he'll better remember them, and have deeper understanding of geometric logic and the relationship of one shape to another.

A Sitka, Alaska, senior high school teacher says, "You never saw such an eager physics class when our project was assembling the atomic power plant kit. By actually building the unit, the students quickly grasped the basic scientific fundamentals of this complex subject and discussed material which ordinarily belonged in college level courses—with scholastic results surpassing previous classes taught without the model kit.

"I am sure this class will always remember the process by which atomic energy is used to create power for peaceful purposes. Perhaps most exciting, however, was the desire of several students to pursue the subject further, obviously motivated by their participation in the project."

Teaching with models is not confined to any grade level—or sex. An instructor at the United States Navy's WAVE Recruit Training Center, Bainbridge, Maryland, reports that they have found model kits the best tool to quickly teach recruits the fundamentals of Navy operation, and comments, "The assembly instructions are so simple that even a woman who believes she has no mechanical skill can understand and learn from them."

Her findings are substantiated in the experience of Stephens College, Columbia, Missouri, a girls' finishing school. Approximately 150 students each year enroll for a basic engineering course. Two years ago each student was required to construct a model of her choice and write a dissertation on the knowledge gained during the process.

"I found at first most of the students were afraid to tackle the model kits," says one professor. "They had been conditioned to believe that girls are not 'mechanical.' It's wonderful to see the way they gain confidence. Many get so enthused that they build an entire collection. This confidence in their newly-found mechanical understanding and skill will probably follow them the rest of their lives and be a real lift."

The Department of Air Science and Tactics, University of Texas; the Citadel, South Carolina, and New York University, as well as many others, including the United States Air Force Academy, are a few of the air science departments using model kits for student motivation and classroom instruction.

At the Air University, Institute of Technology, Wright-Patterson Air Force Base, Ohio, assembled airplane models costing approximately $1 are so authentic that they have replaced hand-made models costing several hundred dollars for use in educational wind tunnel experiments.

EDUCATIONAL television has also discovered the model kit. KTCA-TV, Twin City Area Educational Television, Minneapolis and St. Paul; WJRT, Flint, Michigan; WENH-TV, New England educational network, as well as WQED-TV, Pittsburgh, are typical of those planning teaching programs around the model kit.

A science teacher of WQED writes, "The model kit has proved more effective than pictures in television-science lessons. It permits a close-up view so that the working or structural parts can be clearly seen, how these parts go to make up the whole structure, and the function of each part in the operation of the whole model. The kits add considerable viewing interest to our lessons."

W. Earl Sams, consultant in secondary education, Department of Education, State of California, reports that teachers of junior high schools throughout the state make excellent use of model kits for their

A Woman's Way

by CISSIE

"But the sterling silver teething ring will last the baby a lifetime."

"The only way I can face Frank's retirement is to go out and get a job!"

"Oh yeah, well here comes my 'overprotective' mother now . . ."

science-social studies. The model kits dramatize the social and economic problems growing out of the complexities of the space age. Through the assembly of the model kit, basic scientific principles are more easily clarified.

At the Ohio School for the Deaf, the high school science classes have found communication between students and teacher enhanced during their project of assembling the Westinghouse atomic power plant kit.

The use of model kits is not restricted to the classrooms of America. In the Philippines, Ghana, Mexico, and most of the European countries they have found their way to school. Recently the government of Czechoslovakia lowered its trade restrictions so that its Ministry of Education could import several thousand model kits from England to be used in Czech schools.

The headmaster of a teacher training college in the Belgian Congo faced the problem of educating his pupils to the industrial world in which they were to emerge. Most of his students had never seen an airplane, nor a ship larger than a canoe, nor an automobile other than a jeep. The headmaster bridged a century of learning between primitive days and the atomic age with model kits. Although his recent graduates had never seen a modern automobile, a jet plane, an atomic power plant, or a prop-jet engine, he believes when they finally do, they will not be mystified, but will rather mystify the experts with the knowledge they have acquired by way of the plastic teaching tools.

Of course this model teaching method might well set up new problems for the parent. When a youngster comes home from school with a model kit under his arm and says he's going to do his homework, it might only be an excuse for his favorite hobby. But in any event, the parent should be satisfied that—hobby or not—he is learning. And if it is homework, then, like as not, this is one time that dad will be happy to help him. END

FRACTURE OF THE LEG

Falls and automobile accidents are common causes of leg fracture. The lower leg has two bones, the large shinbone or tibia, and, on the outer side, the slender fibula. The tibia is the weight-bearing bone. Any force great enough to fracture the tibia above the ankle usually breaks the fibula also. Because so little flesh covers the tibia in front, the fracture often is compound—the bone breaks through the skin.

What to Do

1. Give adequate attention to shock, since the injury is major. Place blankets or other covering beneath and on top of the victim.
2. Since the break is usually in the lower third of the leg, and since compounding of the fracture may occur so readily, keep the foot in alignment, preventing foot drop and twisting.
3. When possible summon a physician or ambulance. The leg should be immobilized for transportation. On each side of the leg, place a splint extending from the heel to the upper portion of the thigh. Be particularly careful to adjust bandages so the foot does not create tension at the fracture site by sagging.
4. If splints are not available, wrap a blanket or pillow around the leg and foot to give some support. A determined effort to find good splints should be made, however. Unconscious patients are particularly likely to move the leg about.

Clip and retain on file card for future reference

Vitamin Pills Are NOT a Food Substitute

(*Continued from page 38*)

L. Emmett Holt, Jr., M.D., professor of pediatrics at New York University Medical Center, agrees with Doctor Smith that much of the layman's confusion about vitamin supplements is the result of advertising. "It is difficult for most parents to keep their balance when the claims for therapeutic marvels wrought by vitamin preparations are paraded before them," says Doctor Holt.

Misleading vitamin ads employ a variety of ingenious techniques to persuade the consumer that the vitamin content of his normal diet is inadequate.

For example, one vitamin manufacturer has published a two-page ad which purports to give "the plain facts about vitamins." The ad is written in a question-and-answer style that gives the illusion of a sober, careful discussion of vitamins. The plain fact about this ad is that the questions were carefully chosen to lead to the conclusion that vita-

min supplements are really needed.

Vitamin advertisers often imply that fatigue, depression, and feelings of weakness can be cleared up by taking vitamins. One company advertises its vitamin formula as "important to every otherwise normally healthy man and woman who feels just plain tired and wants a sensible plan to help maintain the pep and energy to enjoy life fully. . ." The tired reader who hopes for more "pep and energy" from the company's product is doomed to disappointment unless his fatigue is due to a vitamin deficiency.

Still other vitamin advertisers base their claims for the need for vitamins on misinterpretations of existing nutritional standards. These companies argue as follows: *Surveys show that the diets of large numbers of people fail to meet the Recommended Dietary Allowances. Therefore, large numbers of people need to take vitamin supplements in order to be adequately nourished.* This is a fallacious argument.

The Recommended Dietary Allowances were established as desirable goals in nutrient intake for essentially all healthy people in the United States. But failure to meet these goals does not imply nutritional disaster. The Recommended Allowances are considerably in excess of the nutrients actually needed to prevent dietary deficiencies from developing. Also, the Recommended Allowances are intended to apply to the population as a whole and are not good criteria for judging individual cases.

But however complicated the ad man's technique, his purpose is simple: to sell vitamins and sell them to everyone. The intelligent consumer should raise a skeptical eyebrow at any ad suggesting he needs to take vitamin supplements without a physician's advice. As Doctor Holt comments: "The recommendation that normal individuals need vitamins in addition to those supplied by a usual American diet is not made by knowledgeable authorities."

Another gimmick used by some vitamin firms is the door-to-door huckster. These salesmen of vitamin pills are usually no more than high-pressure peddlers unqualified to judge whether or not you need vitamin supplementation. Unfortunately, many of them do convince unsuspecting or unsatisfied housewives that their particular brand of pills contains a secret formula guaranteed to increase health and happiness. Don't be fooled. If you feel you have a health problem, consult your doctor.

William B. Bean, M.D., professor of medicine and head of Department of Internal Medicine, State University of Iowa, says about self-prescription of vitamins: "There is not one iota of scientific information which suggests that people who have an adequate balanced diet and have no diseases that interfere with digestion gain any benefit from self-prescribed vitamin or mineral supplements."

He backs up this statement by a number of studies, including his own experiments during a ration test in the army on approximately 1000 healthy men. There was no difference in performance, fitness, or health in two groups of soldiers, one of which had a daily vitamin supplement to the excellent army ration, and the other a placebo (a sugar pill without any vitamins) which appeared identical. The only indication of a difference was that those soldiers getting the vitamin supple-

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refreshing flavor—deodorizing —cleansing—mildly astringent

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American Ferment Division, Breon Laboratories Inc., N. Y. 18, N. Y.

ments excreted large amounts of vitamins in the urine.

Biochemist Charles Glen King, Ph.D., president of the Nutrition Foundation and professor of chemistry at Columbia University, says: "A vitamin deficiency can be identified only by a competent physician—not by a drugstore clerk or door-to-door salesman."

Doctor King is convinced that any reasonably intelligent consumer in modern markets is not likely to select food that will result in vitamin deficiencies. Evidence is good that the average American's diet contains adequate supplies of all vitamins known to be needed, along with the other essential nutrients. Extensive studies in such areas as Philadelphia, Denver, and Nashville show this to be true. The health records of those who took supplements were no better than the records of those who did not.

Nor is there any need for adding supplemental vitamins to a good low-calorie reducing diet. A well-conceived reducing plan includes all the necessary nutrients and will not cause a vitamin deficiency.

Finally, one of the least reliable arguments for vitamin pill-taking is the subjective test—meaning the insistence by the pill-taker that the pills have made him feel better. There is no way for the individual to determine whether his improvement was due to the pills or to the tendency of the condition to clear up of itself. END

The Cell: Chemical Core of Life

(*Continued from page 25*)

chemical mysteries did not exist, and many students regarded the cell as manifesting mysterious "life force"—bags of living jelly or "protoplasm," meaning primal life stuff, a term which explained nothing.

It is true that many apparently organized parts of the cell were observed as microscopes and methods of staining improved. Certain stain-receptive particles in the nuclei of dividing cells, called chromosomes, became the focus of a burgeoning science of genetics in our own century. But only in the past decade have scientists begun to separate and study the mechanisms of once undreamed-of "ultra-structures" of the cell—formed elements revealed by electron microscopes that magnify up to 500,000 times. This revolution in knowledge is made possible by exquisitely sensitive techniques and tools, small as a radioactive atom, that put the minds of men inside the transactions of molecules.

Suppose you looked at a stained section of a typical cell of your body under a light microscope. What would you see? Scattered specks and granules, ameba-like blobs, spatterings, sinuous borders like surf-marks on indented shores — a potpourri of abstract art. But this embalmed cross section is deceptive. It gives no hint of the seething activities of the living cell as it incessantly shuffles energy and raw materials. There is constant simmering movement in the cell: pulsations, streaming motions, bubbling, eddying currents, and whirlpools. These are activities of atomic looms on which the cell endlessly weaves and ravels the chemical fabrics of life.

Let us "get inside" a representative cell of your own body. We have to enter through a membrane that encloses the cell like a gossamer envelope. The cell must take in fuel, excrete wastes, and export finished products through "holes" in its wall. The cell membrane is an ever-changing sheet of molecules that moves in waves and ripples of traffic. It has protuberances and indentations that fit neighboring cells and give mutual support, like inter-locking parts of a jigsaw puzzle.

The cell membrane is an infinitesimally thin sieve, perhaps only two molecules thick. Its "pores" are channels in interlaced networks of protein molecules and lipids (fatty materials). Molecules as small as water can navigate these tortuous canals, but selected oversize molecules can also get through. Mechanisms of membrane traffic control are not completely known. Presumably, the cell exerts some pumping action, and one hypothesis is that lipid molecules, like trap doors, may swing to enlarge pore diameters as need requires.

An atom-sized traveler on the cell surface would have to climb mountains, descend into valleys, and negotiate caverns and precipices of infinite variety. Side-chains, projecting parts, and loops and coils of constituent molecules make the membrane surface very irregular, with profound importance to human health.

The surface is a mosaic of countless "patches," each so shaped that only specific molecules can "make a fit." For instance, the protein coat of a virus may fit an active patch and invade the cell to cause infection. Or an antigenic molecule may fit a patch and cause the cell to leak fluids, with symptoms we recognize as allergies—hay fever, bronchial asthma, hives, and others. If the cell were as big as the earth, the active patch for a certain reaction might be as large as a football field. Detailed knowledge of molecular processes should lead to better drugs for many ailments, and give understanding of natural mechanisms of immunity that are still very mysterious.

Within the cell membrane, filling it somewhat like jelly in a plastic bag, is the cytoplasm. Many early workers regarded cytoplasm as a structureless jelly containing specks of debris. New tools have pried detail after detail from this astounding gel. Its matrix is an intricate network of long protein molecules tunneled by mazes of tubules and channels, supporting a variety of infinitesimal chemical factories, or "organelles," essential to life. The best studied are the "power plants" of the cell, called mitochondria (from Greek words meaning "threadlike granules").

A typical mitochondrion, enormously enlarged, looks rather like a potato or cucumber, although it can change size and shape rapidly and is in constant motion. It is enclosed by a thin double membrane that folds into the interior to form many ridges, like shelves or table leaves. These shelves, according to present knowledge, afford surfaces for sequences of enzymes that effect changes in molecules volleyed from one enzyme to another.

Here, the cell furnace burns sugar products to produce a remarkable energy-packed molecule, adenosine triphosphate or ATP, which is the immediate source of energy in a form that living organisms can use. The starting carbohydrate molecule encounters an enzyme that catalyzes a slight change in its atomic arrangement. It is passed to another enzyme that effects another change,

and on and on in precise step-by-step sequences. Mitochondria can also break down fat to yield energy, or, if more sugar is present than needed, can make fat (a phenomenon distressing to the overweight) by assembling strings of two-carbon-atom units into fatty acids.

Each assembly-line step grows from a preceding step and influences the next. Many enzymes must be arranged in unvarying, repeated sequences. If a specific enzyme is lacking, or out of sequence, the assembly line can break down at any point. Bodily disorders may then result. Mechanisms of many diseases of unknown cause may ultimately be traced to enzyme defects.

Enzymes are enormously complex protein molecules. How does the cell know how to manufacture thousands of different enzymes and marshal them into precisely ordered systems? Directions for structure of an organism are given by heredity-carrying genes, and there is evidence that genes accomplish this sublime feat by controlling the structure of enzymes. But what is a gene and how does it work?

To find an answer we must go to the nucleus of the cell and to molecules found only in its chromosomes —the heredity-carrying particles which, properly stained, are visible under a microscope. Certain fateful molecules within the chromosome cannot be seen, but their structure has been blueprinted in remarkable detail. They are stupendous message-carrying molecules, and the message is nothing less than a chemical directive for design of a human being—or of anything else that lives, or ever lived, or will live.

This master molecule of life is deoxyribonucleic acid, or DNA. It can make exact copies of itself and represents all of our ancestors who are present in our chromosomes. It is the repository of chemical codes that specify the development and structures, the countless proteins and processes of individual organisms. If this code can be fully deciphered, and no doubt it will be some day, we will be closer to an answer to the question, "what is life?"

Yet DNA itself is a pure chemical, a giant molecule, built, in nature's way, of rather simple units. Nearly half of DNA is a form of sugar! A useful model to give a rough idea of the shape of DNA is a spiral stairway. Long, intertwined chains of

Living Legends

A series of little known human interest stories about the world's best known people.

by Andrew Robin

RUTH walked off the train and looked at the hurrying crowd. She was a little frightened and somewhat apprehensive for nowhere could she see her sister, Rosa. Both girls had been born and raised in China, but her sister had preceded her to Wheaton College, Illinois.

A smiling young man in patched work clothes walked toward her and said, "I'm from the college. I'm here to pick up your luggage."

"Thank you," she replied shyly. When he had placed her bags on the truck she asked, "Is there a bus or taxicab I can take to the college?"

"You may ride with me."

There was a startled look on her face. Blushingly he assured her, "The truck is clean—you don't have to worry."

Once they were on their way he thought rapidly of how to talk to this black-haired, brown-eyed girl with the pretty face and trim figure.

"You've been to China?" he asked.

"I was born there," she said in a chilly voice, trying to discourage him from talking.

"That's very unusual, isn't it?"

"Not really, people are born every day in China."

He shrugged off the sarcasm, but his intense interest in the girl almost caused a collision along the tree-lined Wheaton streets.

At the apartment Ruth was to share with Rosa, the truck driver carried the heavy luggage up three flights in two back-breaking trips.

The two didn't meet formally for some time. Ruth was eager to complete her studies and return to China as a missionary.

That very first Sunday, the two sisters were sitting in the Student Church when the sacristy door opened and the pastor stepped out. As he approached the rostrum Ruth gasped. "That's the truck driver!"

The pastor nodded to the congregation and half-smiled when his eyes met Ruth's. Rosa explained that the pastor was a second-year student who earned his tuition by driving a truck.

Their common spiritual concerns drew them together. He wanted to save souls, while she felt that God protected her through 20 years of wars, famines, and diseases to make her a missionary in China.

Who is this woman? *(See answer below.)*

Ruth Graham, wife of evangelist Billy Graham.

molecules coil around a common axis and are tied together by "rungs," like a ladder. Resemblance to a ladder is more apparent if the model is unwound and flattened out. Uprights of the ladder are built of repeating units of simple sugar and phosphate groups. The rungs are rather simple nitrogen-containing bases, chemically related to caffeine and uric acid.

There are four kinds of "rungs," or nucleotides. We can identify them by letters: A for adenine, T for thymine, C for cytosine, G for guanine. But since adenine pairs only with thymine, and cytosine with guanine, the "letters" are really twins—AT and CG, or TA and GC.

Now, imagine that you pull an invisible zipper down the middle of a DNA molecule. This gives two halves with exposed edges that have unsatisfied chemical bonds, thousands of severed rungs in varied A, T, C, G sequences. Each half-molecule picks up specific chemical partners to make it whole again. So we get two new DNA molecules, identical with the original DNA molecule that was "unzipped." It is as if each half-molecule were a living template, or mold, for building its complementary half. Thus, DNA makes mass copies of its hereditary information.

How is this life-directing information "written?" There are serious gaps in knowledge. But in some wondrous way, the "letters" of nucleotides constitute a chemical dot-and-dash code for the manufacture and organization of molecules that "come to life" in a living organism. The cryptogram of life seems to be encoded in millions of sequences of four kinds of molecular "rungs" on the DNA ladder.

If your own DNA molecules were lined up end to end they would make a thread a little less than two yards long, containing about five billion code letters. In terms of the alphabet, that is enough letters to fill 5000 books of 500 pages each. This fantastic library is incorporated into your chromosomes, along with proteins and other material. Each turn of the DNA spiral has nine cross links, and a chromosome contains about 10 million turns, or approximately 100 million chemical dot-and-dash code symbols directing your life processes.

Recent evidence suggests that the omnipotent gene may be a region of a few nucleotide crosslinks in the long DNA molecule, that genes determine the patterns of an organism by determining the structure of enzymes, and that the line-up of genes corresponds to sequences of enzymes in the cell's multitudinous processes.

A single mitochondrion of a liver cell can contain, according to an estimate by Albert Claude, eminent biochemist, a million protein molecules. This is enough to give 2000 duplicates of 25 enzyme systems, each built of 20 protein units. A cell may contain several hundred or several thousand mitochondria. An enzyme molecule can effect changes in as many as 500,000 molecules per minute.

This staggering production of enzymes and countless other protein molecules seems to be delegated by DNA to a different form of nucleic acid, RNA or ribonucleic acid. It differs from DNA in that its sugar molecules possess an additional oxygen atom—a trifle of tremendous import.

What this country needs is dirtier fingernails and cleaner minds. **—Will Rogers**

The bulk of RNA is found in the cytoplasm, about half of it in strand-like organelles, called microsomes, so tiny as to be at the very limits of microscopic dimensions. Here and in associated cytoplasmic structures are vital centers for protein synthesis, where RNA serves as a template for making the thousands of protein constituents of an organism. RNA presumably receives its code from DNA and acts as an agent for the master molecule. Minute amounts of RNA can be detected in certain chromosomes, and there is evidence that it moves continually from the nucleus into the cytoplasm to do its vital chores.

This brief and oversimplified account of some of the activities of your cells must skip a thousand details. The exciting import is that techniques of molecular biology give utterly new opportunities for understanding the precise mechanisms of health and disease, which is to say, of life and death.

A list of diseases and disorders of unknown cause must include peptic ulcer, allergies, gout, cancer, diabetes, mental illness, hardening of the arteries, multiple sclerosis, heart attacks, Parkinsonism, epilepsy, arthritis. But a full list would include virtually all the ills of man, in the sense that hidden changes in body chemistry at the level of molecules are not precisely known.

For many diseases, of course, our physicians have treatments that cure, relieve, or control. But the precise way in which many of our most effective drugs work is unknown. Both the mechanisms of disease and the actions of medicines depend upon structures and functions of molecules. Detailed understanding of myriads of interacting structures should make it possible to draw atomic blueprints for "tailor-made" drugs to accomplish some specific action of cell chemistry.

Researchers who are becoming molecular architects may some day design a drug to correct some unknown molecular defect of carbohydrate metabolism, and so cure diabetes, a disease for which there is now no cure. Or they might design a molecule to keep our arteries as pliable as a youngster's into our 80's or 90's. This may sound visionary, but considerable numbers of "tailor-made" drugs have already attained medical uses, and new ones are constantly being designed and tested by pharmaceutical industry researchers.

Good examples are drugs useful in treatment, though not cure, of some forms of leukemia. These compounds are chemical counterfeits of one of the nucleotides or rungs in the DNA ladder. DNA accepts the "fake" molecule into its structure, with the result that its ladder has thousands of defective rungs. The cell containing the "doctored" DNA cannot thrive and divide—exactly what is desired if the cell is a malignant type that proliferates wildly.

It is easy to find cell poisons, but difficult to find a drug that will seek out a cancer cell unerringly and have no effect on normal cells. If researchers can discover some molecular peculiarity about a cancer cell, they may be able to design a compound lethal to that cell alone.

Cells may also be used as commercial drug-makers. Indeed, in "whole" forms, they already are. Microbes make antibiotics, plants make many drugs, animal tissues yield others. There seem to be no insuperable reasons, other than great cost and technical difficulty, why single cell-strains cannot be made to produce drug crops for harvesting.

Why does the rauwolfia plant produce reserpine, a molecule that tranquilizes human minds and reduces high blood pressure? Why does the foxglove plant make digitalis, a molecule that regulates the human heart beat? Plants do not have minds or hearts or blood pressure. But at the level of the cell, all living things are kin. The cell of a pneumonia germ is no less marvelous than any single cell of your own.

Some compounds made by plants can be synthesized more cheaply by human chemists, and the next cheapest way is to extract them from plant materials. But under some foreseeable circumstances, mass production of known or unknown drugs by pure cell colonies might become very important. Diabetics might be freed from animal sources of insulin if human pancreatic cells could be grown en masse to yield large quantities of the hormone. Growth hormone of the pituitary gland is species specific—that is, growth hormone of an animal is ineffective in man. Human growth hormone for medical investigation is in exceedingly short supply. A single living pituitary cell might be encouraged to multiply prolifically under rigidly controlled conditions and produce lavish quantities of growth hormone and other pituitary products. Fantastic though they seem, just such projects are under long-term, high-risk investigation in pharmaceutical laboratories.

Molecular studies of the cell also give new insights into drug actions, basic to understanding medicines. Ability to metabolize drugs seems to reside largely in enzymes of liver cells. Morphine causes a cell to "boil" and bubble; strychnine makes a cell constrict. Drugs apparently react on unimaginably small patches of the cell membrane that are properly shaped to receive them. Acetylcholine, a molecule concerned with transmission of nerve impulses, is active in amounts that cover only one six-thousandth of the cell surface. Slowly, facts wrested from the cell contribute to more exact knowledge of drug actions on basic processes. Scientists may even resolve a mystery that most laymen probably think was solved long ago: the puzzle as to exactly how aspirin works.

Profound mysteries of aging, of normal and abnormal growth, of degenerative diseases, mental deterioration, feedback mechanisms that switch chemical activities on and off in trillions of interconnected cells of the human body, lie hidden in atomic traffic that pulses incessantly within us. Great advances in medicine are bound to come from the revolution in the life sciences that seeks detailed knowledge of molecules that shape our ends. END

Food Supply for Spacemen

(Continued from page 52)

counterbalanced by the centrifugal force of the spacecraft speeding along in its curved path. Weightlessness will be a way of life for all spacemen—a way of life totally unlike anything encountered on earth.

In this condition, our earth style methods of eating are difficult, if not impossible. Open top glasses, cups, and plates are just so many useless mementoes of earth life because solid and liquid food floats, as does everything else not fastened down. Liquids do not pour from bottles or cups, but form weird looking globs that are maddeningly adept at evading one's mouth. Dry or powdery foods can be downright dangerous in weightlessness, as they are easily inhaled.

There are many refinements science can provide to simplify the mechanics of eating in space. For instance, food can be reduced to paste form and packaged in plastic or metal squeeze tubes. A wide variety of pre-cooked foods, including meats and vegetables, can be provided. Such a food supply is lightweight and easy to handle.

Squeeze-tube eating is quite simple. The spaceman merely uncaps the tube, inserts the open end in his mouth and squeezes the cylinder. The paste is forced into his mouth, where its stickiness makes it adhere to the inside of the mouth. This makes it

"you'll save—they'll rave!" when you send

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REPEATS MONTH AFTER MONTH!

RARE GORGEOUS FRUITS, FINEST GROWN

from Harry and Dave 'way out in Oregon

Hardly 1 person in 1000 ever gets such exciting gifts (not in stores—limited supply). Hand picked, direct from tree to you. Nothing else like it, and you'll never hear the last of it.

3-BOX CLUB (Shown) Royal Riviera Pears* at Christmas; January, Apples; February, Grapefruit. Order Gift No. 11 — only $12.85 delivered

12-BOX CLUB The whole year—a dozen dazzling gifts! At Christmas, Royal Riviera Pears; January, Apples; February, Grapefruit; March, Royal Oranges; April, Pineapple; May, Preserves; June, Home-Canned Fruit; July, Nectarines; August, Pears; September, Peaches; October, Grapes; November, Spanish Melons. Order Gift No. 20 — only $53.95 delivered

8-BOX CLUB Same as 12-Box omitting March, April, June, August. Order Gift No. 15 — only $34.95 delivered

Your giftmanship'll get you thanked all year. Each sumptuous gift is beautifully packaged with your greetings enclosed.

EASY TO ORDER: Send list of names plus check or M.O. (No charges or C.O.D.), tell us how to sign greetings. Order now—Air Mail!

FULLY GUARANTEED

Harry and David

Box 2510, Medford, Oregon

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a letter from STAN DELAPLANE

ONE OF THE softest jobs in the writing business is writing about babies. I wonder why I have not taken it up myself.

People who write about babies often get pretty gooey. Some of them write like a mouthful of hush puppies.

"Please realize that your baby cannot be bad. He is innocent of any evil intention."

That is what I read by a gentleman who writes about babies.

"It won't be meanness that will make him cry. It may be hunger. It may be that a pin is hurting. It may be that his last meal is not digesting properly . . ."

Ah yes. It also may be that he wants to get out of the crib and blast you with a .45. I am not sure about babies and their intentions. Not at all.

☆ ☆ ☆

Babies are very peculiar. Once in a while I get in an elevator and find one hanging over its mother's shoulder. Right in my face.

This is a situation you should avoid.

No matter what I do, this innocent child looks me full in the eyes and sets up a terrible bawling.

The mother leaps about and faces me like a tiger. Everybody in the elevator says: "Tch, tch."

I am suspected of—I don't know what I am suspected of. But it seems if a child is looking at you, it is innocent. It cannot be bad. But if it yells, you are a dog. A lowdown varmint.

☆ ☆ ☆

Ordinarily I pass babies by and give them no time of day at all. Should I pass a baby carriage outside the supermarket I give it a wide berth.

This is very contrary to the way ladies act. A lady sees a baby carriage and boo! She is right over chucking the child under the double chin.

"Itsy bitsy kitchy koo!" she cries. The moppet sets up a holler for the gendarmes. Mama comes running out. Soon as she see it is another lady, she is all smiles.

They sit down and exchange formulas and discuss how you should "bubble" the child after chow.

If I dare lay one pinkie on the baby, the mother screams copper. And in no time at all I am in the nearest precinct station making a free and voluntary confession.

That is the relation between me and babies.

☆ ☆ ☆

What I mean, I am friendly. But babies and their mothers are not friendly to me.

Now I am very suspicious of this baby writer. He goes into teething. And as I remember the time my offspring was springing her first choppers, it is no time to be around babies at all. (*Continued on page 84*)

relatively easy to swallow the paste.

However, squeeze-tube food would be practical only for fairly short space flights, of not more than two or three weeks at most. We have found that there are certain drawbacks to subsisting on paste food for a prolonged period of time. An Air Force volunteer who spent three days in our one-man space cabin simulator living on tube food was quite specific about his objection. "The chow was good," he said, "but I wanted something I could *chew*."

For space trips of one to two months, d e h y d r a t e d, pre-cooked foods would be more desirable. A diet of wider variety can be provided in dehydrated form than in tubes. Also, a great deal of dehydrated food can be packaged into a small space, so it is practical f r o m a weight-space aspect. It would not be necessary to take along extra water to rehydrate the food; this could be done with recycled body water, which our experiments have shown can be processed to a purity surpassing that of tap and even bottled water. Moreover, dehydrated foods keep for long periods of time without refrigeration. And, perhaps most important of all, Air Force volunteers who lived on this type of food during 30-day tests in our two-man space cabin simulator, liked it very much.

Dehydrated food will also pose certain problems for the spaceman, however. For one thing, there is the rehydration process. This takes time, particularly in weightlessness where the water must be either in a closed container or directed by pressure. Then, too, the rehydration process must be very exact, lest the quality of the food be impaired. Finally, the food must be warmed or cooked—and cooking in a space cabin poses a whole new set of unique problems.

For example, as presently conceived, the atmospheric pressure in a space cabin will be much less than at ground level. One reason for this is that same old problem, the high fuel-weight ratio. If we gave our spacemen sea level air pressure, the cabin hull would have to be stronger and heavier to withstand the higher pressure differential resulting when the space craft enters the very hard vacuum of space. Even with a strong hull, the problem of cabin leakage would be formidable. Thus, by having less air pressure in the cabin we sidestep a great many difficulties.

And again we meet our eerie companion — weightlessness. Food that floats, or if liquid breaks up into little, unmanageable blobs, obviously cannot be cooked in the same type of pots and pans we use on earth. How, then, is our spaceman to cook, if he is not to starve in the midst of plenty?

What may be the ideal solution to both problems is a modified pressure cooker or a brand new item—a pressure frier. Temperatures suitable for complete cooking would be possible with a pressure cooker because the air pressure within it would be high enough to permit greater temperatures. The same would be true of a pressure frier. With such appliances clamped firmly in place, our hungry spacemen would be able to cook their food completely—and would not have to chase it all over the cabin while doing so!

SPACE cooking will very probably be done by electricity supplied, for example, from solar batteries. It would be totally impractical, particularly on long voyages, to carry along bulky, heavy supplies of bottled gas. At any rate, open flame cooking would be extremely difficult, would be a needless drain on the cabin oxygen supply, and would be accompanied by the danger of carbon dioxide and carbon monoxide produced by the open flame.

From all of the foregoing it is apparent that the problems of feeding future spacemen are, in total, numerous, complex, and interlocked. We can forget about "easy" answers like a food pill. We estimate that one spaceman will need at least a pound of dehydrated food per day to stay alive and healthy. Only a doggedly dedicated and extremely hungry spaceman would be able to swallow a one-pound pill daily or a four-ounce pill four times daily. He just might prefer starving!

We may oversimplify the problem slightly by stating that we have three possible solutions from which to choose. One is that we can provide our spacemen on long voyages with the same food variety and type they get on earth. To do this, we would have to figure on a vast amount of excess weight. This, then, is not a practical choice. We can go to the other extreme and provide an absolute minimum of variety. This would certainly reduce the weight, storage, and preparation problems — and would probably reduce our spacemen too! Finally, we can conceive a diet which falls somewhere between the two extremes. This appears to be the most feasible of the three choices because it takes into account *all* pertinent factors: weight-fuel ratio, storage, preparation, health, and mental satisfaction on the part of the spaceman himself.

Before we can take steps to bring this choice to reality, we must find out just how a person reacts to a diet of minimum variety. By minimum variety we mean just that: a plain but healthful food with none of the eye or taste appeal we have come to expect of food.

My two sons and I recently spent three weeks on such a diet. We had two specific purposes in mind. We wanted to find out what our physical and mental reactions would be to a minimum variety diet offering just one very flat taste, and we wanted to see how well we would be sustained by dehydrated food which has been stored a long time.

In this land of plenty, minimum variety diets are not easy to come by. We had to find some very special ingredients. Only aged, dehydrated food would do and it was extremely difficult to find. After much searching we were finally able to get some four-year-old egg and milk powder from the Army. From a country store near San Antonio we obtained several dusty boxes of oatmeal which life had passed by for several months. We artificially aged a supply of dried beef by additional drying at room temperature. When "ready" it resembled thin slices of leather in both taste and appearance.

NEXT, we ground all of these ingredients and mixed them into a commercial shortening to form a thick paste. The result was a brown-speckled, grayish-yellow substance of singularly unappetizing appearance. But it had sufficient caloric value to keep us alive and healthy, was somewhat chewy, would keep at room temperatures, and definitely had the required flat taste.

We permitted ourselves one luxury. We agreed that we would periodically supplement our diet with dried apricots and bits of chocolate.

During the first week we all lost weight due to insufficient calories in the paste. With the addition of more shortening we gradually regained the weight. We also lost a considerable amount of our enthusiasm as the novelty of the experiment wore off. This we did not regain. By the end of that first week we agreed that we felt a certain resentment toward our freckled "goop."

Our resentment was subtly replaced by antipathy during the second week. We found that we no longer looked forward to meal times, as we had in the past. Now we waited until our hunger pangs were absolutely insistent before we sat down to our meal of paste. Even the apricots and chocolate lost their charms. Our mental and physical efficiency remained normal, however.

BY the third week our antipathy had been replaced by indifference to food. Our appetites had greatly diminished. Eating had become a routine task with little attendant pleasure — or discomfort, for that matter. It was merely a job we had to do to live. It was in this final week of the test that we had to draw most heavily upon our scientific motivation to keep to the diet. We had grown indifferent to food, but we had not forgotten its taste. Still, we were able to do our daily work without undue physical or mental fatigue.

We emerged from the experiment in good health and with all our faculties intact. One of them—taste—had not been of much use for three weeks but we quickly set that straight with a full breakfast of ham, eggs, potatoes, hot coffee, fruit juice, milk, and hot biscuits. I'll remember that meal with great affection for the rest of my days.

We gained some interesting information from this experiment. For one thing, we think it is safe to say that we created a food without the slightest vestige of appeal to our senses. Yet, despite our reactions to it, we concluded that a space crew could gradually become adapted to a similar but less Spartan diet. There would be no impairment of health or functional abilities.

It would of course be a simple matter to provide a wide variety of tastes in a food paste like ours. With artificial flavoring, it could be made to taste like roast beef, chicken, steak, shrimp, or eggs. But we know that a wide variety of foods and tastes is not essential to health or working ability, providing the food one does eat is nutritionally sufficient.

For space trips of many months,

even years, the problem of a food supply calls for a much more sophisticated solution than a minimum variety diet. Again the reason is that old hurdle, fuel-weight ratio. Fuel—always important—becomes the important single item on extended voyages in space. Every ounce of it must be conserved for liftoff, spatial maneuvering, emergencies, atmospheric re-entry, and soft landing. In the payload on a flight of this type, it is not enough to reduce every component to its minimum size and weight. It is not enough to merely store food. We must take a giant step further. We must have a system that gives us everything we need to live and work and that replenishes itself endlessly.

Such a system is not new, but is as old as our earth. Actually, our earth is nothing more than a gigantic space ship whirling through space in a solar orbit. Its hull, if you will, is the dense layer of atmosphere which protects terrestrial life from deadly solar and cosmic radiations and which permits our plant life to photosynthetically and endlessly purify our atmosphere, replenish it with oxygen, and give us food. We believe that an infinitely smaller version of this closed ecological system will be the heart of the payload on an extended space voyage.

For several years scientists at the School of Aerospace Medicine have been working to develop such a system. The problems are many. We want a system which will produce food and water, purify the cabin atmosphere, and provide all the oxygen the crew needs. We have reason to believe that such a system might even produce a portion of the space ship's fuel supply.

WE have made satisfying progress thus far. A portion of what we seek has been found in algae, a one-cell water plant which is seen on still lakes and ponds. We know that certain types of algae are remarkably fast at absorbing carbon dioxide and producing oxygen. Many of these types are edible.

Following up work done by Jack Myers, Ph.D., of the University of Texas, our scientists have created an algae chamber which has provided a breathable atmosphere for several mice over a period of several months. A modified chamber sustained a small primate for a prolonged period.

The process works something like this. Algae is suspended in a transparent tank of nutrient solution and exposed to light. Carbon dioxide from the living organism is permitted to enter the tank where the plants absorb it and give off oxygen. This is returned to the organism. As this endless cycle continues the algae grows and must be periodically harvested. When cooked it is edible and can form the basis for a wide variety of foods. With it one can make breads, cakes, soups, even *ersatz* steaks. One needs only a few additional ingredients.

Eventually it may be possible to add higher forms of life to the algae system to produce some of these ingredients. Tiny clams, shrimp, and plankton could be added to create a sort of aquatic space farm. These delicacies, together with processed algae, could provide both a tasty and a healthy diet. Best of all from a logistics standpoint, the whole thing is self-replenishing.

STILL another advantage exists in the realization of a life support system for future space cabins. The time will come when astronauts will land on the moon to establish a beachhead scientific colony. There is no food on the moon; it will have to be delivered there or grown there. The former method would be fantastically expensive, but the latter may prove feasible. However, the hard vacuum on the surface of the moon, the searing heat of lunar "days" and the subpolar temperatures of the "nights" require elaborate protective measures. With such measures it would seem possible for a portion of the craft's life support system to be transplanted to the moon and nurtured. In time, this micro-farm might be expanded to the point where it could support a number of persons. Gradually, several of these farms of considerable size could be created.

Once these lunar farms were established, the men on the moon would have enough food for themselves. Eventually, they would be able to stockpile food and serve as a provisioning point for space ships headed still farther into the outer fringes of our solar system. END

EDITOR'S NOTE: The viewpoints contained in this article are those of the author and do not in any way constitute a statement of official U.S. Air Force policy.

Iodine: Much More Than a Germ-Killer

(Continued from page 51)

at the beginning of this century, this iodine compound was relegated to the pharmacist's shelf. But not for long. Not until the new "miracle drugs" came along after World War II was the iodine finally completely superseded as a mainstay in the treatment of syphilis.

Certain iodine compounds often are prescribed for amebic dysentery. These drugs destroy the microscopic animals which cause the disease. In remote areas where drinking water is likely to contain dysentery organisms of the *shilgella* or *salmonella* groups, iodine tablets known as tetraglycine hydroperiodide may be added to water to make it safe for human consumption.

Iodine compounds are invaluable in x-ray and fluoroscope work. Administered orally or by injection, they provide an opaque background which enables the doctor to detect gallstones, kidney stones, inflammation of the genito-urinary tract, tumors, obstructions in the bronchial tubes and lungs. He can get a clear picture of the heart chambers, arteries and veins of the brain, spot otherwise undetectable abnormalities of the circulatory system.

Radioactive iodine—sometimes called "the atomic cocktail"—is another great contribution to modern medicine. The amount necessary to obtain a response from a Geiger counter is infinitesimal. If a fraction of an ounce of the stuff were mixed thoroughly with 5000 tons of chalk, a single tablespoon of the mixture would excite a Geiger counter to action.

THE atomic cocktail is used to track down and treat disease. In testing the condition of the thyroid gland, for example, the patient drinks a glass of water containing a minute amount of radioactive iodine. Within 24 hours, the thyroid, which usually absorbs about 500 times more iodine than any other tissue of the body, will register on the Geiger counter the amount concentrated there. An underactive thyroid will absorb less than the normal amount; an overactive thyroid will concentrate more and therefore register above normal.

If the tracer indicates hyperthyroidism—a disease characterized by

bulging eyes, rapid heart action, and nervous irritability—a larger dose may be administered as treatment. Radioactive iodine atoms bombard the gland with destructive short-range beta rays which destroy the overactive cells and establish normal metabolism. Adjacent tissues are not harmed.

A few years ago such treatment would have cost about $3000. Today, with a generous supply of radioactive element on hand at the government atomic pile, full treatment costs only about $75 to $100.

It is often difficult to convince patients who have perused science fiction and scare headlines in the newspapers that this treatment is simple, safe, and effective. One woman told her doctor she was afraid to take it because she would "glow in the dark" like the radium dial of a watch. A hyperthyroid invalid for years, she was jittery, thin as a rail, chronically depressed. Three months after beginning the treatment she was a new woman—calm, happy, interested in life, full of energy. For the first time in her life she felt equal to the task of driving an automobile!

THE atomic cocktail has been used in the treatment of cancer of the thyroid, with encouraging results. The cancerous gland does not absorb as much iodine as a normal one. However, investigators found that when the thyroid is removed by surgery, together with other cancerous tissue in the immediate area, the body reacts more favorably to radioactive iodine therapy. Many surgeons now use a Geiger counter to insure that all cancerous material has been removed.

Radioactive iodine has also been used in the treatment of angina pectoris—most painful of all heart diseases—and of congestive heart failure—a disease in which that organ is unable to maintain an adequate blood flow. Though strictly experimental at this time, and very difficult to manage, this type of therapy opens up a promising field for investigation.

This treatment does not cure the basic heart condition. Rather, it slows down the thyroid, which in turn lowers the rate of metabolism. The lower metabolic rate means that the heart does not have to work so hard.

Iodine has been used as a bacteria

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killer since 1873 and has survived the competition of new antibiotics in many kinds of treatment because it is efficient and economical. As an antiseptic in households and hospitals, iodine traditionally has been used in tincture form—dissolved in alcohol. Not generally realized is that iodide salts also dissolve readily in water. And aqueous solutions of iodine are highly germicidal. For first aid treatment, however, dilute tincture of iodine is best. (Caution: Leave the application uncovered to avoid skin burns.)

The exact manner in which iodine kills germs is not known, but it is believed that the element interferes with enzymes that are required for bacteria metabolism. Elemental iodine is approximately 200 times as effective as phenol (carbolic acid) in germ-killing power. Iodine shows little selective action in its germicidal activity; it is effective against all types of bacteria. It also is effective against fungi, amebae, and some viruses.

Yes, that iodine solution in your medicine cabinet is more than a handy antiseptic. It is a key chemical in atomic-age medical science. END

Letter From Stan Delaplane

(*Continued from page 80*)

"Your baby has to learn a new method of eating," says the baby writer. "If we give the baby a bone when we are ready to teach this important lesson, chances are it will go directly to his mouth as does everything else he gets hold of."

Now this is the first time I ever heard of giving a baby a bone. But I see no reason why not. If the dog is through with it.

☆ ☆ ☆

As I look it over there is a tremendous amount I do not know about babies. And it is possible that I cannot start writing about them until I get more information.

I have learned that you should avoid them in elevators. I have also learned that they slobber a good deal if you hold them. I have wondered about this. And I am happy to learn that it is because their little mouths are watering for a good juicy bone.

Possibly one of mine. That is my opinion anyway. END

Let's Talk About Food

(*Continued from page 20*)

sweetened condensed mik. Evaporated milk contains 7.9 percent fat and condensed milk contains 8.5 percent.

Upon dilution with water, evaporated milk closely resembles whole milk, although it has a cooked flavor. Condensed milk is too sweet to be used in place of whole milk after dilution.

So much emphasis has been placed on protein and there seem to be so many kinds that I am confused. What is meant by high quality protein?

There has been a lot of fuss about proteins. Advertisers and educators have told about power-packed proteins; go-power proteins; protein-lift proteins; complete, incomplete, lazy, and working proteins; animal-vegetable, high quality and low quality, balanced and unbalanced proteins. What does it all mean?

The nutritional value of a protein depends upon its amino acid composition and upon the availability to the body of the component amino acids. Generally, proteins from animal sources are of higher quality than those from vegetable sources because the animal proteins contain greater quantities of amino acids not manufactured by the human body.

However, mixtures of plant proteins or mixtures of plant and animal proteins, such as from milk and cereal, are usually of high value. A varied diet with reasonable food intake contains many different sources of proteins, and the resulting mixtures are more than adequate to meet protein requirements.

The fact that the food, when consumed, is generally mixed with other food proteins is often overlooked when a food is promoted on the basis of its quality or quantity of protein. The amount of protein provided in a serving is frequently not mentioned at all. Witness the various breakfast cereals.

There is no question that an adequate protein intake is essential. Generous quantities are provided in meats, poultry, fish, eggs, nuts, beans, whole grains, cereals, milk, cheese; it's all around us. In areas of the world where these foods are scarce, protein can be a problem. This is not the case in the United States. END

King Turkey

(*Continued from page 43*)

instead of flour to make sure of a smooth gravy.

There are as many ways to use cranberries at Thanksgiving as there are berries in a bushel measure. To cut kitchen work, the canned whole berry sauces and the clear jellies are delicious and require no preparation. Here are other ways to put cranberries into the festive menu:

Fresh Cranberry-Apple Tarts

- 2 cups (½ pound) fresh raw cranberries
- 4 cups (4 medium) diced, tart, peeled apples
- 1¼ cups sugar
- ½ teaspoon salt
- ½ cup water
- 3 tablespoons quick-cooking tapioca
- 1 teaspoon pure vanilla extract
- 6 teaspoons butter or margarine
- Pastry, using 3 cups flour

Wash cranberries and mix with apples, sugar, salt, and water in saucepan. Cover and cook 10 minutes. Stir in tapioca and cool. Add pure vanilla extract. Turn into six 5-inch tart pans lined with unbaked pastry. Dot each with 1 teaspoon butter or margarine. Roll the remaining pastry, half at a time, to ⅛ inch thickness. Cut into strips ½ inch wide. Arrange over tops of tarts, interlacing to form a lattice. Bake in a preheated hot oven (425°F.) 25 minutes. Serves 6.

Cranberry Grape Chutney

- 4 cups fresh cranberries
- 2 cups sugar
- 2 cups red or white grapes, cut in half and seeded if necessary
- 1 cup vinegar
- 1 cup raisins
- ½ cup sliced onion
- 1 teaspoon ginger
- 1 teaspoon mustard seed
- 1 teaspoon salt
- ¼ teaspoon paprika
- 2 tablespoons grated lemon rind
- 3 tablespoons lemon juice

Combine all ingredients in heavy saucepan. Cook slowly 30 to 35 minutes or until of desired thickness. Makes about 5 cups chutney.

Cranberry Stuffed Onions

- 4 large mild onions
- 1 cup fresh cranberries, cut in halves
- ½ cup finely-diced celery
- ½ cup sugar
- ¼ cup raisins
- 2 tablespoons chopped walnuts
- ½ teaspoon whole thyme
- ¼ cup melted butter
- 1 bouillon cube
- ⅔ cup boiling water

Remove onion skins; cut out centers leaving ½-inch shell. Cook in boiling salted water for 10 minutes; drain. Combine cranberries, celery, sugar, raisins, walnuts, and thyme. Add melted butter and toss. Spoon into onion cavities. Place in baking dish. Dissolve bouillon cube in boiling water; pour over onions. Cover and bake in hot oven (400°F.) about 1 hour or until tender; baste onions occasionally with pan juices. Serve hot. Makes 4 servings.

Traditionally, the Thanksgiving menu contains a galaxy of vegetables: always potatoes (either sweet or white), squash or turnips, white onions, and one or more green vegetables. Hot rolls, corn sticks, sweet rolls, pickles, and jams also belong in every old-fashioned menu.

Saucy Sprouts

- ½ cup sliced or slivered almonds
- ⅛ teaspoon leaf thyme, crushed
- 2 tablespoons butter or margarine
- 1 can (10½ ounces) condensed cream of chicken soup
- 2 packages (10 ounces each) frozen Brussels sprouts, cooked and drained

In saucepan, brown almonds with thyme in butter. Stir in soup. Heat, stirring now and then. Combine with Brussels sprouts; heat a few minutes. Makes 4 to 6 servings.

Stuffed Butternut Squash

- 1 large (3½ pound) butternut squash
- ¼ inch boiling water in baking pan
- ¼ teaspoon salt
- 1/1[illegible] teaspoon ground black pepper
- 1 pound sausage meat, cooked
- 1 cup soft bread crumbs
- ¼ cup diced fresh onion

Wash squash, cut in half lengthwise and scoop out stringy portion. Invert in a shallow baking pan. Pour

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in ¼ inch boiling water. Bake in a preheated hot oven (400°F.) until tender, 20 to 30 minutes. Remove from oven and turn cut side up. Sprinkle squash with salt and black pepper. Crumble cooked sausage meat and combine with bread crumbs and onion. Spoon into cavities of squash. Place in a pan; pour ½ inch boiling water around squash. Reduce oven temperature to moderate (350°F.); bake 25 minutes or until crumbs are brown. Yields 4 servings.

Rutabaga Souffle

- 2 cups mashed cooked rutabagas or turnips (about 1¼ pounds)
- 2 tablespoons butter or margarine
- 1 cup soft bread crumbs
- ⅛ teaspoon ground black pepper
- 1 teaspoon salt
- 1 tablespoon sugar
- ½ cup milk
- 1 egg, beaten
- 1 tablespoon butter or margarine, melted

Combine first 7 ingredients and beat until fluffy. Beat in egg. Turn into a buttered 1-quart casserole. Brush top with melted butter or margarine. Bake in a preheated moderate oven (350°F.) 45 minutes or until brown. Makes 6 servings.

Herb Cheese Potato Puffs

- 8 cubes (½ inch) mild cheddar cheese
- 1 envelope instant mashed potatoes
- 2 eggs
- ½ teaspoon salt
- ½ teaspoon dried dill or 1½ teaspoons fresh dill, chopped
- 2 tablespoons melted butter or margarine

Cut cheese into cubes and let warm to room temperature. Prepare potatoes as directed on package. Add eggs to potatoes, one at a time, beating well after each addition. Add salt and dill and mix well. Divide into 8 portions. On well-greased baking sheet shape potato mixture into mounds with a cheese cube inserted in center of each. Drizzle ½ of the butter or margarine over the mounds. Bake in a hot oven (400°F.) until heated and tipped with brown, 18 to 20 minutes. Brush with remaining butter or margarine and serve immediately. 8 servings.

Celery, cucumber sticks, raw carrot sticks, ripe and green olives usually take the place of salad for Thanksgiving dinner. However, for a delicious change, try these marinated green beans.

Blue Lake Beans Vinaigrette

- 1 (1 pound) can whole blue lake green beans
- 2 tablespoons chopped pimiento
- ¼ cup salad oil
- 1½ tablespoons lemon juice
- ½ teaspoon salt
- ¼ teaspoon dried dill
- Freshly ground pepper
- 1 teaspoon instant minced onion
- Shredded lettuce
- 1 hard-cooked egg

Drain green beans. Combine all remaining ingredients except egg and lettuce and shake together in small jar. Pour over beans, and let stand in refrigerator an hour or longer. Spoon onto crisp shredded lettuce, and top with chopped hard-cooked egg. Makes 4 to 5 servings.

For dessert, pumpkin pie of course. Again modern technology has cut kitchen time for the homemaker. Canned and frozen pumpkin are perfect for pie. Or, for a change:

New England Spiced Indian Pudding With Ice Cream

Heat 3 cups milk in a double boiler. Slowly add ½ cup corn meal, stirring constantly. Cook 20 minutes, stirring occasionally. Stir in ¼ cup butter or margarine, ¾ cup sugar, and ½ cup mild-flavored molasses. Remove from heat. Add ½ teaspoon each, salt, ground ginger, ground nutmeg, and ground cinnamon. Blend in 2 well-beaten eggs. Turn into a buttered 1½-quart casserole. Place in a pan of hot water and bake in a preheated slow oven (300°F.) 2 hours. Stir 3 to 4 times during the first hour of baking. Serve warm in parfait glasses in layers with vanilla ice cream. Top with ice cream. Yields 8 servings. END

International Language

(*Continued from page 59*)

isted. During the Middle Ages, Latin was spoken and understood by educated persons throughout the civilized West. A Norman baron, an Italian merchant, and a German banker of the 13th century could converse freely and fluently in Latin, even though their native languages were French, Italian, and German. Later, French became the language of international diplomacy. When the European nations met at Vienna in 1815 to end the Napoleonic wars, French was used as the official language of the conference.

Latin has long ago ceased to be a spoken language and many persons have never studied it. In the area of diplomatic relations, the United Nations needs five official languages to transact its business — French, English, Russian, Chinese, and Spanish. The situation today seems unfavorable to the adoption of any national language as a universal tongue.

The multiplicity of languages is itself a problem. According to the language scholar, Mario Pei, there

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Roasters (larger young birds)	6 - 12	3½ - 5	2½ - 3½
	12 - 16	5 - 6	3½ - 4½
	16 - 20	6 - 7½	4½ - 6
	20 - 24	7½ - 9	6 - 7
Halves, quarters, and half breasts	3½ - 5	3 - 3½	Same time as stuffed
	5 - 8	3½ - 4	
	8 - 12	4 - 5	

are at present 13 major national languages, each of them spoken by at least 50 million persons. If we were to choose a universal language from this group of 13 on the basis of the number of speakers, Chinese with its 600 million representatives would come first. Next in order of population would be English, Hindustani, Russian, and Spanish.

Alexander Gode, Ph.D., the leading proponent of Interlingua, points out that no language has ever attained an international position unless it was associated with a dominant political or cultural force. The spread of Medieval Latin was due to the acceptance of the Church as a major authority throughout Europe. No nation in the world today occupies a comparable dominant position.

Doctor Jung describes what is probably the major stumbling block in adopting a national language as a universal tongue: "We need a second language that everyone can learn, but there is no immediate hope of adopting one of the national languages. It would be like choosing one menu from a single restaurant and attempting to suppress the others. We have to reckon with national pride."

To be effective, any universal second language would have to be selected by an international congress, with delegates appointed by the various governments. The governments would have to agree to accept the decisions of the congress and incorporate the chosen language into their educational systems.

Speakers of such widespread languages as Spanish would be offended by the choice of another tongue. The adoption of Russian or English would seem to be blocked by the competition and ill-will between the Communist and the Western powers. Also, both Russian and English are extremely difficult languages and require many years to learn well. Chinese and Hindustani, even if all the dialectical variations were ironed out, are largely unknown outside the Far East and most Westerners would balk at accepting them.

The attempt to find a neutral international language that is not associated with a specific country has given rise to the various "artificial" or "constructed" languages. Unlike the national languages, which developed spontaneously and evolved their present shape through generations of use in daily living, the constructed languages are all creations of individuals or small groups of men.

These languages derive their vocabulary from several national languages and usually feature a newly-devised grammar and simplified spelling. Interlingua is one of approximately 600 such language systems, of which the most widely known is Esperanto.

Interlingua was created by the International Auxiliary Language Association (IALA). Founded in 1924, the IALA engaged a research staff of language scholars who began to investigate and compare the existing proposals for international languages. This preliminary study occupied 20 years. The IALA scholars gradually came to the conviction that underlying all the various European languages was a common language system.

Mindful that all successful international languages have been associated with a world political or cultural force, IALA saw the modern representative of such a force in science. Scientific research and its application are a major feature of modern life and one that is world-wide. IALA noted that the language of science tends to cross national boundaries and that scientific terms in different languages bear a family resemblance. The language of science and technology was seen as a nucleus, a core vocabulary around which an international language could be constructed.

IALA scholars were further convinced that the ultimate source of the language of science was the Greco-Roman tradition and the languages which developed from it—French, Spanish, Portuguese, Italian, and English. Interlingua was constructed with these languages as a base, with German and Russian as contributors.

When the Interlingua-English dictionary appeared in 1951, it contained a vocabulary of 27,000 words. To be included in the dictionary, each word had to appear in similar forms with similar meanings in three of the base languages.

The final form in which the words were cast was also intended to be international. For example, the Spanish word for *earth* is *tierra*, in French it is *terre*. The letters *ie* in *tierra* are a distinctively Spanish formation and the final *e* in *terre* is

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distinctively French. Both of these purely national characteristics are removed in Interlingua and *earth* becomes *terra*. The reader who has studied Latin would have no trouble interpreting the word since it is identical with the Latin term for earth. The English reader who recalls *terrestial* would also recognize the meaning at once.

The Interlingua grammar was devised in a similar manner. No grammatical feature was included in Interlingua if it was missing from so much as one of the source languages. No grammatical device was omitted if it occurred in all of the source tongues. The result is a very simple grammar.

AS Doctor Jung comments: "Like the metric system, Interlingua is surprisingly easy. Both Mrs. Eloise Murray, who prepares the Interlingua abstracts for JAMA, and I were able to read Interlingua at sight. We taught ourselves to write it with only occasional references to the grammar as problems came up. The most difficult feature of Interlingua grammar is the conjugation of verbs and an hour's drill is sufficient to master that."

Spelling in Interlingua is no problem. The words are spelled the way they're pronounced and pronounced the way they're spelled. This is a marked contrast to a language like English where the letters *ough* can represent no less than five different sounds — bough, cough, rough, through, and though.

Each week 10 to 15 Interlingua items appear in JAMA. Here is a brief sample from one abstract in a recent issue:

"Centro de Los Angeles pro Prevention de Suicidio. —Le disveloppamento de un centro (cuje personal inglobava psychiatristas, psychologos, e travaliatores social) pro prevenir suicidio ha jam rendite multe information valutabile. Datos ab Los Angeles confirma reportos ab altere sources que multe accidentos e homicidios son intimemente parentate con suicidio."

Translation:

"Los Angeles Suicide Prevention Center. —The development of a center (whose personnel includes psychiatrists, psychologists, and social workers) for the prevention of suicide has already yielded much worthwhile information. Data from Los Angeles confirm reports from other sources that many accidents and murders are intimately related to suicide."

Members of JAMA's staff who work with Interlingua find the language capable of expressing medical material fully and precisely, both in original articles and in abstracts. The suitability of Interlingua for literature has been demonstrated by the late New York psychiatrist, Merrill Moore, who composed scores of Interlingua sonnets.

Like any other living language, Interlingua is capable of spontaneous growth. But this same capacity for growth creates a problem. A language which is still developing must add new words to cope adequately with other linguistic material and with the world around it. JAMA's Interlingua translators have found it necessary to develop several hundred new words and phrases in the course of their work. New words are created for Interlingua on the same principles used to develop the original 27,000-word vocabulary, and have the same power of international intelligibility. This growth process is going on every day among users of the language and eventually larger Interlingua dictionaries will be needed to incorporate the useful additions.

Interlingua is not a truly universal language. The basis of Interlingua in the Romance languages places the person who knows only English at disadvantage, since English has many Germanic elements that are not found in the languages derived from Latin.

THE German and Scandanavian people are handicapped to an even greater extent; these languages contain very few Romance elements. However Latin is still widely taught in Germany and Scandanavia and this knowledge makes Interlingua accessible. Little is known as yet about Interlingua's reception in Russia, but the scientific and technical terms that are the backbone of Interlingua are known to be widely diffused in the Russian language.

Neither is Interlingua easily intelligible to peoples of the East who speak languages of Arabic, Sanskrit, or Chinese origin. But as JAMA indicated in its editorial of February 1960, Interlingua could serve as a bridge from non-occidental scientific literature. If an Eastern writer were to present his findings in Interlingua or an Interlingua summary, he would be immediately intelligible to the occidental world.

MANY serious thinkers feel strongly that a second language should be taught to children in all countries of the world from the time they begin school. This language would serve not only as an international tongue for science, commerce, and travel, but would enable international political meetings to dispense with the time-consuming and hazardous device of the interpreter. Interlingua would rank high on any list of candidates for a simple and practical international language. END

FOR FURTHER READING

Dictionaries:

Interlingua-English Dictionary. Alexander Gode. Storm Publishers, New York, 1951. Hard-bound: $5.00; paperbound: $3.00.

English - Interlingua Dictionary. Woodruff W. Bryne. Storm Publishers, New York, 1959. $2.00.

Grammar:

Interlingua: a grammar. Alexander Gode and Hugh E. Blair. Storm Publishers, New York, 1951. $3.50.

Readers:

Interlingua a Prime Vista. Alexander Gode. Storm Publishers, New York, 1959. $2.00.

Dece Contos. Alexander Gode. Storm Publishers, New York, 1959. $1.50.

For further information on Interlingua, contact: Interlingua Division, Science Service, 80 E. 11th Street, New York 3, New York.

TRANSLATIONS FOR INTERLINGUA CARTOONS

Man in barber chair:
"There are some disadvantages to being the only doctor in town."

Nurse and babies:
"Now who started this racket?"

Doctor and patient:
"You dare prescribe pills of the same color as Helen Smith's for me!"

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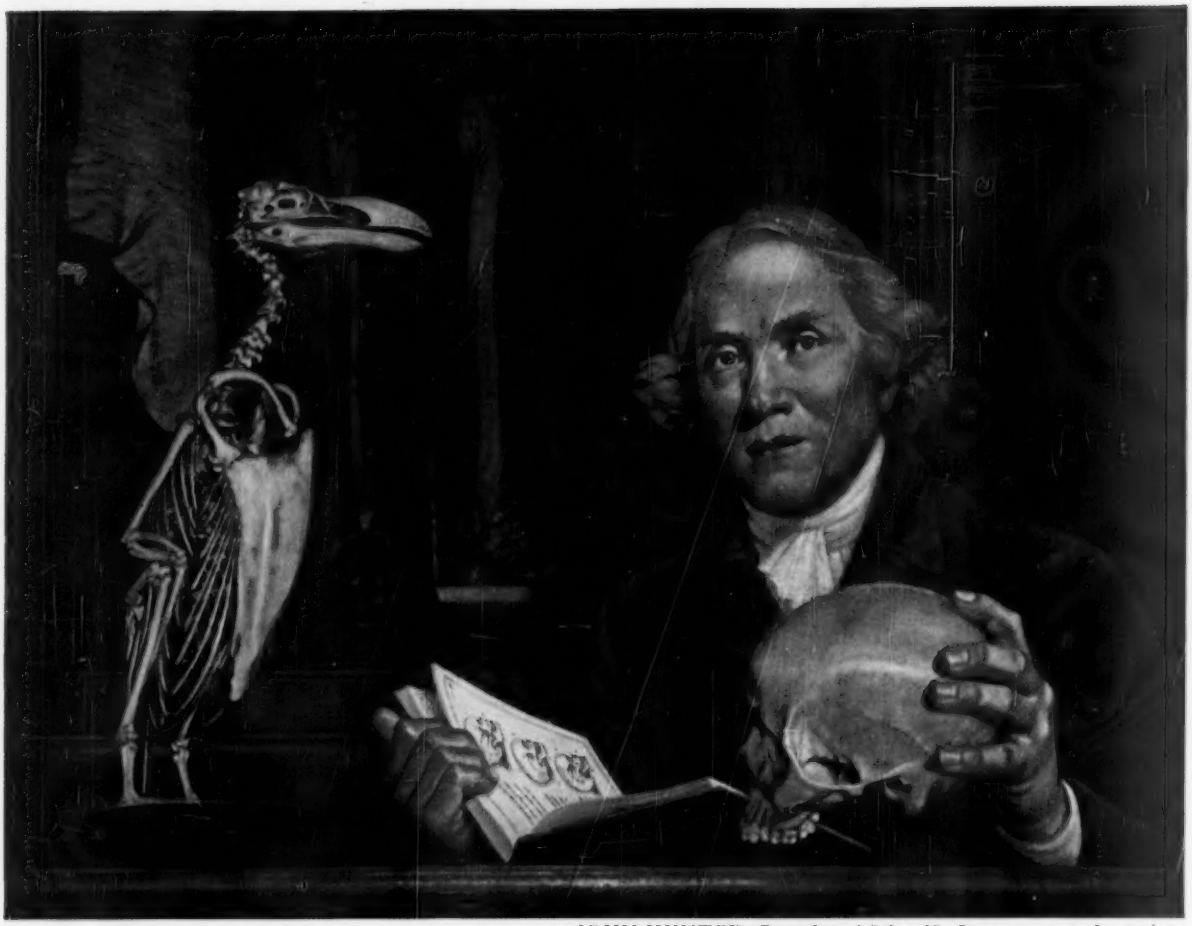

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